TCP/IP Connection User's Guide

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About This Guide

This guide explains how to install, configure, and use the TCP/IP Connection software on a Macintosh computer. It provides a functional overview of the MacTCP and MacSNMP software, lists the system software and hardware requirements, and describes how to install the software and configure MacTCP. This guide also provides instructions for using the MacSNMP Client application.

Intended audience

This guide is intended for users who require instructions to

- install (and possibly configure) the MacTCP 2.0 software on their networked Macintosh computers
- install the MacSNMP software and use the MacSNMP Client application to communicate with their network administrator

How to use this guide

- Chapter 1, “Introduction,” provides basic information about MacTCP and MacSNMP and lists the system requirements for using the software.

- Chapter 2, “Installing the TCP/IP Connection Software,” lists the possible ways you might obtain the software from your network administrator; explains how to install the appropriate hardware drivers, a prerequisite to installing the rest of the TCP/IP Connection software; and describes the steps for installing the TCP/IP Connection software on your Macintosh computer.
- Chapter 3, “Configuring MacTCP,” describes the configuration tasks you must perform, according to the level of configuration authority assigned to you by your network administrator.
- Chapter 4, “Using MacSNMP Client,” describes how to use the MacSNMP Client application. This chapter is relevant if SNMP network management has been implemented in your environment.
- Appendix A, “Name-to-Address Mapping,” describes the syntax of the Hosts file and how to edit it.
- Appendix B, “Troubleshooting,” describes the duplicate address notification feature, and describes the fault-isolation tool, MacTCP Ping.

Conventions

The following conventions are used in this guide:

- 6.0.x refers to system software version 6.0.5 or later, but not version 7.0 or later.
- 7.x refers to system software version 7.0 or later.

◆ Note Text set off in this manner presents sidelights or interesting points of information. ◆

△ Important Text set off in this manner—with the word Important—presents information that you must consider as you read the surrounding text. △

▲ Warning Text set off in this manner—with the word Warning—indicates that an action could cause damage to hardware or software, or loss of data. ▲

Associated documents

McCloghrie, K., Rose, M., “Management Information Base for Network Management of TCP/IP-based Internets: MIB-II” Request for Comments 1213, DDN Network Information Center, SRI International, March 1991.

Internetworking With TCP/IP—Principles, Protocols, and Architecture, Second Edition, by Douglas Comer, Prentice-Hall.

The MacTCP Administrator’s Guide, which is included in the TCP/IP Administration package, provides a detailed, theoretical discussion of TCP/IP.

1 Introduction

TCP/IP Connection provides the software to connect a Macintosh computer to a TCP/IP network and to manage the Macintosh from a console using the Simple Network Management Protocol (SNMP). This chapter describes the features, system requirements and operation of the TCP/IP Connection software.

What is TCP/IP Connection?

TCP/IP Connection is a software product that allows a Macintosh computer to connect to a TCP/IP network and allows the computer to be centrally managed. TCP/IP connectivity is provided by MacTCP 2.0, Apple Computer's implementation of the protocol suite known as Transport Control Protocol/Internet Protocol (TCP/IP). Management capability is enabled by MacSNMP, Apple Computer's implementation of the Simple Network Management Protocol (SNMP).

Depending on your network, your network administrator has implemented either one or both of these capabilities with the software described on the following pages.

MacTCP 2.0

MacTCP is a software driver for the Macintosh Operating System that implements the TCP/IP protocols. These protocols provide core transmission services that are used by third-party applications such as electronic mail, remote login, file transfer, remote printing, and database access.

The MacTCP driver includes these features:

- a control panel interface for configuring the driver
- a driver-level interface that allows the implementation of application protocols such as the File Transfer Protocol (FTP) and Telnet.
- a domain name resolver that maps domain names to internet addresses (The domain name resolver is compatible with domain name server implementations that comply with RFC 1034 and 1035.)
- notification to the user of the occurrence of a duplicate IP address

MacSNMP

SNMP is a widely accepted standard for managing devices on a multivendor network. An SNMP network management system consists of SNMP management software running on a computer called a console and SNMP agent software that is installed on each networked computer. The agents installed on a networked computer collect information—called variables—from the computer and relay this information to the management console.

MacSNMP is Apple Computer's implementation of SNMP on the Macintosh. It provides the agent side of an SNMP network management system, allowing Macintosh computers on multivendor networks to be managed by third-party SNMP consoles.

MacSNMP includes these features:

- allows Macintosh computers to fit into existing SNMP management systems
- allows remote network and system management of Macintosh computers over a TCP/IP network
- provides a control panel interface (MacSNMP Client) that lets the user communicate with the management console and perform some modifications to the MacSNMP configuration

MacTCP Token Ring Extension

The MacTCP Token Ring Extension is an alternate link access protocol module for the MacTCP driver. It allows Macintosh computers to run the MacTCP driver in a Token Ring network and to access TCP/IP hosts and services available on that Token Ring.

The MacTCP Token Ring Extension is a MacTCP device (mdev) file that resides in the Extensions folder in the System Folder (on computers running system software version 7.x) or in the System Folder (on computers running version 6.0.x). The MacTCP Token Ring Extension can work with 4 megabits-per-second (Mbits/s) as well as 16-Mbits/s Token Ring networks.

△ **Important** If you plan to install the MacTCP Token Ring Extension, you must have installed either an Apple TokenTalk NB Card, an Apple Token Ring 4/16 NB Card, or a third-party Token Ring card that includes a driver that conforms to the .TOKN interface specification. Follow the installation instructions that came with the card. If your computer has a TokenTalk NB Card installed, you might not have the most current driver, in which case you need to upgrade. Chapter 2 describes how to use the Network Software Installer (NSI) program to install the newest driver for the TokenTalk NB Card or Token Ring 4/16 NB Card. △

MacTCP Ping

MacTCP Ping is a network testing tool that can be used for network fault isolation, measurement, and management.

System requirements

To use the TCP/IP Connection product, you need the following hardware and software:

- On a LocalTalk network you need a Macintosh Plus computer or later model connected to the LocalTalk cable.
- On an Ethernet network you need a Macintosh Plus computer or later model with an Ethernet connection such as the EtherTalk NB Card, the Ethernet NB Card, a built-in Ethernet interface, or a third-party Ethernet device. Apple Ethernet connections require EtherTalk software version 2.5 or later. Third-party Ethernet devices must be compatible with the MacTCP driver.
- On a Token Ring network you need a Macintosh computer that uses the NuBus™ expansion slot architecture, such as one of the Macintosh II family of computers, and an appropriate networking card, such as the TokenTalk NB Card, the Token Ring 4/16 NB Card, or a third-party Token Ring card that supports the .TOKN interface specification. Apple Token Ring connections also require TokenTalk Phase 2 and TokenTalk Prep software, version 2.5 or later (the software for the Token Ring card) and the MacTCP Token Ring Extension software contained in this product. Third-party Token Ring cards must be compatible with Apple Computer's MacTCP Token Ring Extension software, or the manufacturer must provide its own extension software that is compatible with the MacTCP driver.

- To use the AppleTalk encapsulation feature of MacTCP to connect to systems outside of the AppleTalk internet, the AppleTalk network must contain a Datagram Delivery Protocol-Internet Protocol (DDP-IP) gateway.
- To use MacTCP software you need system software version 6.0.5 or later, or system software version 7.0 or later.
- To use the MacSNMP software, you need system software version 7.0 or later and 4 megabytes (MB) of RAM.

△ **Important** The TCP/IP Connection disk is a high-density disk. You need a high-density floppy disk drive to read this disk. △

Network environment

The TCP/IP Connection software runs over LocalTalk, Ethernet, and Token Ring–compatible network environments. A Macintosh Plus computer or later model can run the MacTCP driver.

The MacTCP driver is co-resident with AppleTalk protocols so that there can be concurrent TCP/IP and AppleTalk operation. For example, you could download a file with File Transfer Protocol (FTP) while a print job is being sent to an Apple LaserWriter printer over LocalTalk. AppleTalk and MacTCP software can run over the same medium, or one protocol can run over one medium while another protocol runs over a different medium.

Figure 1-1 shows a MacTCP network running over LocalTalk, Token Ring, and Ethernet network environments.

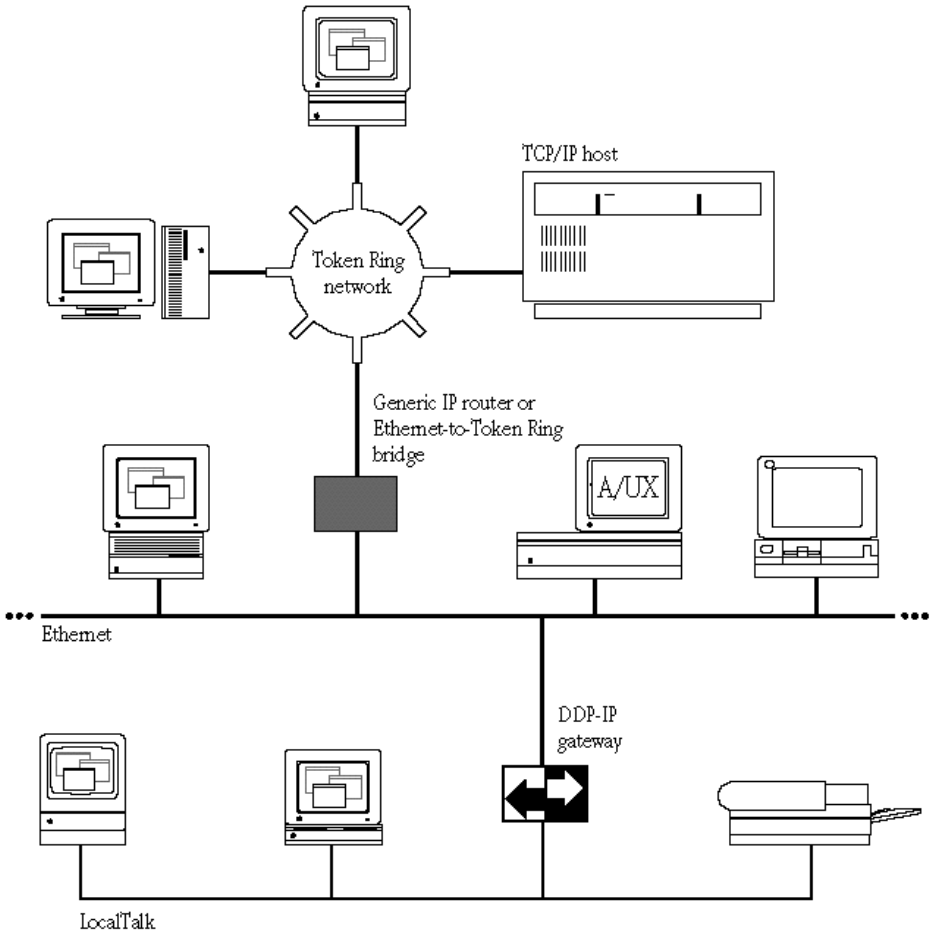


Figure 1-1 A MacTCP network configuration

2 Installing the TCP/IP Connection Software

This chapter describes how to install the TCP/IP Connection software on a Macintosh computer that participates as a client on a computer network.

◆ **Note** If you have a floppy disk system (no hard disk), you can install the MacTCP software if you run system software version 6.0 .x. (However, you will not be able to install or use the SNMP software on a version 6.0 .x system.) For computers running system software version 7 .x, we recommend installation of MacTCP and MacSNMP software on a hard disk only.

Obtaining the software from your network administrator

Your network administrator has determined a method for distributing and installing the TCP/IP Connection software that best suits your environment.

- You may have received a MacTCP startup disk. If so, you do not need to perform any installation tasks. Follow your network administrator's instructions for configuring and using the MacTCP startup disk.
- You may have received the software on a disk, along with a printed copy of this manual.
- You may have received a message to download the software and user instructions from a server onto a disk and use the disk to perform the installation.
- You may have been instructed to install the software directly onto your computer from a server on your network.

Follow your network administrator's instructions, using the procedures in this guide to check details.

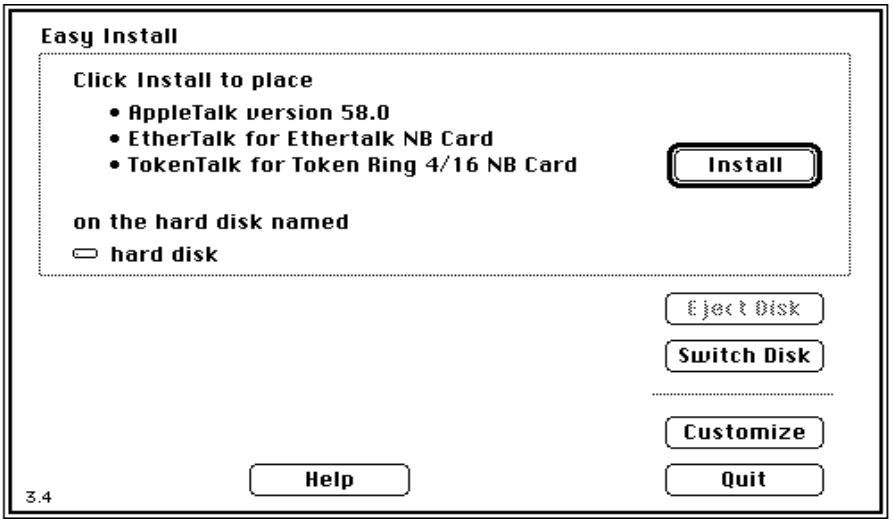
Updating your network software

Before you install the TCP/IP Connection software, it may be necessary for you to run the Network Software Installer (NSI) program, version 1.3 or later, to install AppleTalk version 58.0 or later and other appropriate drivers for your system. Only then should you proceed to the TCP/IP Connection installation instructions that apply to your system software version. To use the NSI program, perform the following steps:

1 **Insert the *Network Software Installer* disk into your floppy disk drive or connect to the network device where the NSI program is located.**

2 **Open the *Network Software Installer* disk or folder, then double-click the Installer icon to open the Apple Network Software Installer program.**

The Network Software Installer startup screen appears. Click the OK button. The Easy Install dialog box that appears lists the software that the Installer will place on your hard disk.



3 **Make sure that the hard disk indicated on the screen is your current startup disk.**

If another disk is indicated, click the Switch Disk button until the name of your current startup disk appears.

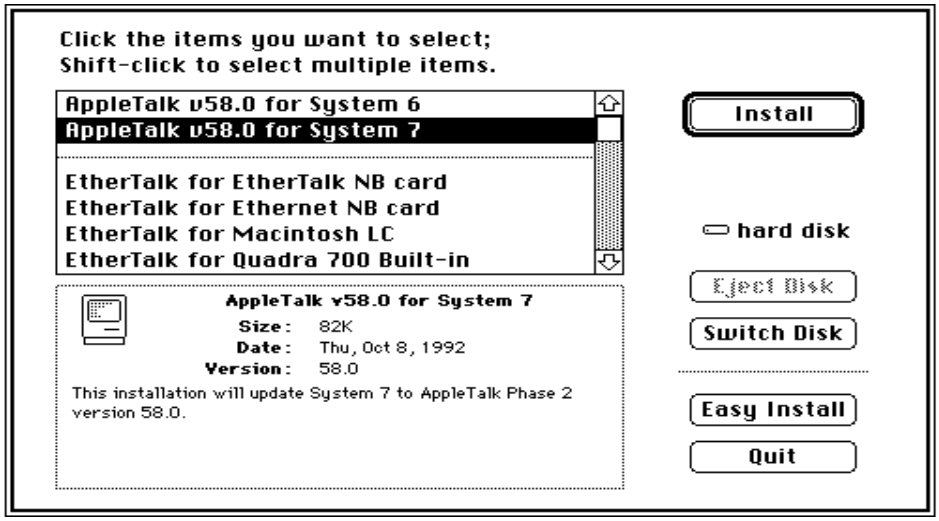
4 **Indicate how you want to install the software.**

If you want the Installer to choose software based on the type of Macintosh and interface cards you have, click Install and then proceed to step 8.

If you want to manually choose which software to install, complete steps 5 through 9.

5 **Click Customize to select specific software options for installation.**

The Customize dialog box lists all software options available for installation.


Click the items you want to select;
Shift-click to select multiple items.
AppleTalk v58.0 for System 6
AppleTalk v58.0 for System 7
EtherTalk for EtherTalk NB card
EtherTalk for Ethernet NB card
EtherTalk for Macintosh LC
EtherTalk for Quadra 700 Built-in
AppleTalk v58.0 for System 7
Size: 82K
Date: Thu, Oct 8, 1992
Version: 58.0
This installation will update System 7 to AppleTalk Phase 2 version 58.0.
Install
hard disk
Eject Disk
Switch Disk
Easy Install
Quit

6 **Click an item in the list to select it, then Shift-click all additional items to be installed.**

7 **Click the Install button to install the selected software.**

8 **If you see a message indicating that the software cannot be installed on the current startup disk while other application programs are running, click the Continue button. (If you do not want to quit other open application programs, click the Cancel button.)**

Installation on the active startup disk "hard disk" cannot take place while other applications are running. Click Continue to automatically quit all other running applications. Click Cancel to leave the disk "hard disk" untouched.
Cancel
Continue

The Installer begins to install the selected software on your hard disk. On-screen messages report the progress of the installation.

9 **When you see a message reporting that the installation was successful, click the Restart button. Your computer will restart with the new driver software you just installed.**

◆ **Note** If you are using the Token Ring 4/16 NB Card, you must set the speed for your card before using the MacTCP Token Ring Extension. Follow the instructions in the next section, "Setting the Network Speed for Your Macintosh." If you do not have a Token Ring 4/16 NB Card, turn to the section "Installing TCP/IP Connection Software." u

Setting the network speed for your Macintosh

If you are using the Token Ring 4/16 NB Card, you must set the speed for your card before using the MacTCP Token Ring Extension. The Token Ring control panel allows you to set the network speed for your Macintosh computer to that of the Token Ring network to which your Macintosh is connected.

1 **Choose Control Panels from the Apple (** **) menu.**

2 **Open the Token Ring control panel.**

If you are running system software version 7 .x, double-click the Token Ring icon in the Control Panels window to open the Token Ring control panel.

If you are running system software version 6.0 .x, the control panel icons are displayed in a scrollable list on the left side of the window. Click the Token Ring icon to open the Token Ring control panel.

If you have either a Token Ring 4/16 NB Card or a TokenTalk NB Card installed, the slot number in which the card is installed appears highlighted. If more than one Token Ring card is installed, the slot number corresponding to the card that has the lowest address appears highlighted. You can change the card selection by clicking another slot number that contains the Token Ring icon.

Before you can change the network speed for your Macintosh, you must first click the Allow Changes button. The Allow Changes button becomes the Lock Settings button.

◆ **Note** If a TokenTalk NB Card is selected, the 16 megabits/second speed always appears dimmed because the TokenTalk NB Card does not support 16 Mbits/s. ◆

3 **Click either the "4 megabits/second" button or the "16 megabits/second" button.**

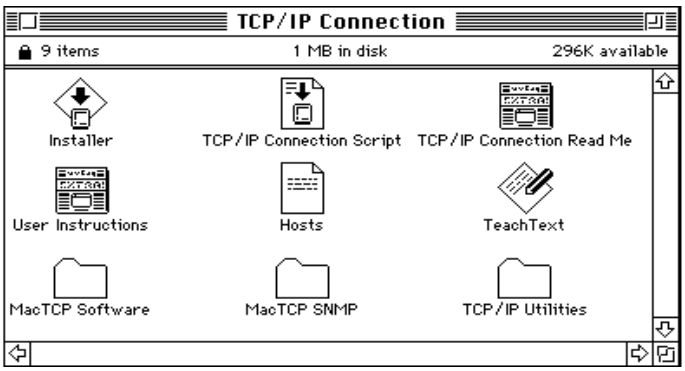
▲ **Warning** All devices on a Token Ring network must be set to the same network speed. Do not change the network speed without first receiving authorization from your network administrator. Because of cabling or equipment specifications, not all networks support a network speed of 16 Mbits/second. Setting your Macintosh computer to a different network speed from that of the Token Ring network to which your computer is connected will disrupt network services the next time you use the Token Ring 4/16 NB Card. ▲

Once you've selected a speed and clicked the Save button, one of two things will happen:

- If a program is currently running on the Token Ring 4/16 NB Card, the network speed will become effective when you restart your Macintosh computer.
- If no program is running on the Token Ring 4/16 NB Card, the network speed will become effective the next time the Token Ring 4/16 NB Card is initialized.

Installing TCP/IP Connection software

Depending on your network and system software version, your network administrator may have instructed you to install either just MacTCP software or both MacTCP and MacSNMP software. Accordingly, your network administrator has made available some or all of the files shown in the following window.



The installation procedures on the following pages describe how to install the TCP/IP Connection software for your system and network environment. A few of the files must be installed manually, and the procedures indicate where to place these files. Most of the files are automatically placed in the right location on your computer by the Installer program and the TCP/IP Connection Script. The following chart shows where the Installer places each file.

File name	Where installed	Function
MacTCP	Control Panels folder	provides basic TCP/IP software
MacTCP Token Ring Extensions	Extensions folder	allows IP connectivity over Token Ring
SNMP MacTCP Agent	Extensions folder	reports MacTCP SNMP variables
Shared Library Manager	Extensions folder	provides dynamic linking and loading of code
SNMP Manager	Extensions folder	provides basic SNMP functionality
SNMP Preferences	Preferences folder	needed by the SNMP system
SNMP TCP/IP Transport	Extensions folder	allows SNMP to run over IP networks
SNMP Macintosh Agent	Extensions folder	reports Macintosh-specific variables

To install the MacTCP software on your Macintosh computer's hard disk or on a startup disk, follow the appropriate set of instructions on the following pages.

△ **Important** If you already have MacTCP software on your system and have received a new version of the MacTCP driver, ask your network administrator if the new driver has been preconfigured. If it has, your network administrator might instruct you to remove any existing MacTCP Prep file before you install the new MacTCP driver. △

Installing only MacTCP on a hard disk—version 6.0.x or 7.x

To install the MacTCP software on a hard disk, perform the following steps:

1 **Get the MacTCP software from your network administrator.**

Follow your network administrator's instructions for obtaining the files you need.

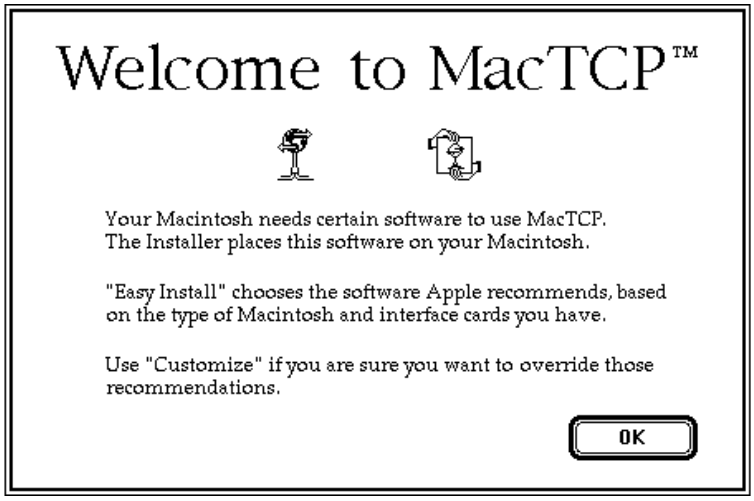
2 **If you received a Hosts file, drag it into your System Folder.**

If your network administrator intends for you to customize the file, refer to the instructions in Appendix A, “Name-to-Address Mapping.”

3 **If you received a MacTCP Ping file, drag it onto your hard disk. (This file may be in a folder named TCP/IP Utilities.)**

4 **Double-click the Installer icon to open the Installer program.**

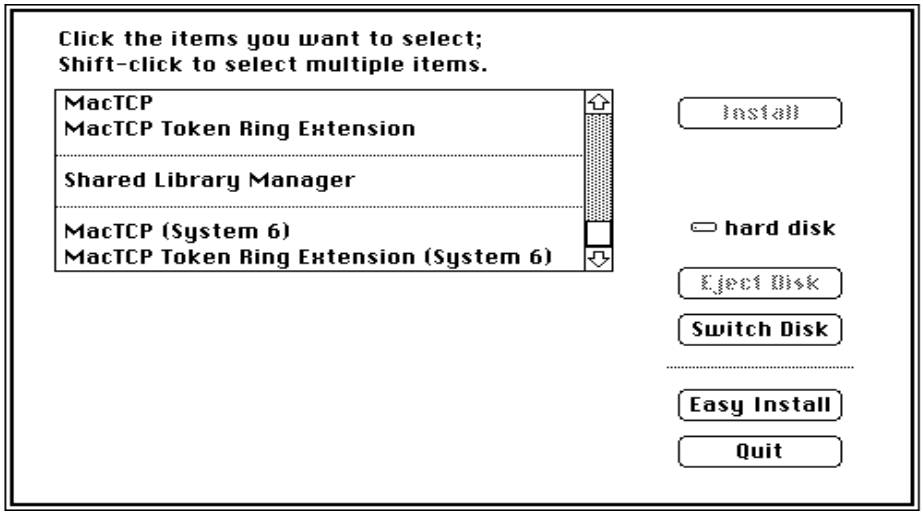
The “Welcome to MacTCP” screen appears. Click OK.


Welcome to MacTCP™
Your Macintosh needs certain software to use MacTCP.
The Installer places this software on your Macintosh.
"Easy Install" chooses the software Apple recommends, based on the type of Macintosh and interface cards you have.
Use "Customize" if you are sure you want to override those recommendations.
OK

5 **Click Customize to select specific software options for installation.**

The Customize dialog box lists all software options available for installation.

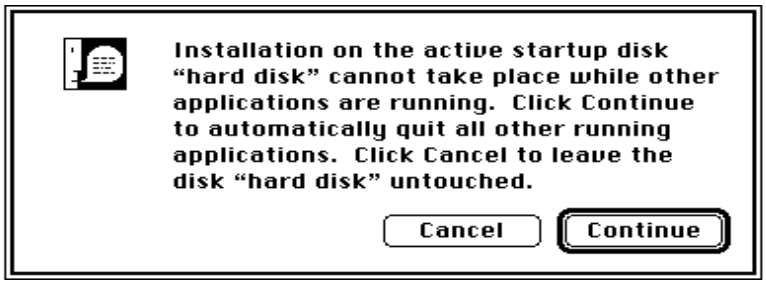
6 **Select the appropriate version of MacTCP for your system. Use the scroll bar to find “MacTCP (System 6).”**



7 **If you have a Token Ring connection, select the appropriate version of the MacTCP Token Ring Extension for your system. Use the scroll bar to find "MacTCP Token Ring Extension (System 6)."**

8 **Click the Install button to install the selected software.**

9 **If you see a message indicating that the software cannot be installed on the current startup disk while other application programs are running, click the Continue button. (If you do not want to quit other open application programs, click the Cancel button.)**


Installation on the active startup disk "hard disk" cannot take place while other applications are running. Click Continue to automatically quit all other running applications. Click Cancel to leave the disk "hard disk" untouched.
Cancel
Continue

The Installer begins to install the selected software on your hard disk. On-screen messages report the progress of the installation.

10 **When you see a message reporting that the installation was successful, click the Quit button to exit from the Installer program.**

11 **Turn to Chapter 3, "Configuring MacTCP," to configure the software on your Macintosh computer.**

Installing only MacTCP on a floppy disk–based system—version 6.0.x only

To install MacTCP on a floppy disk–based system, perform the following steps:

△ **Important** It is recommended that you use a high-density disk. If your computer does not support the high-density disk drive, perform a customized system software installation to install the minimum system software for your specific computer. △

1 **Create a startup disk.**

Install system software version 6.0 .x on a blank disk. (The disk may have to be initialized.)

2 **Get the MacTCP software from your network administrator.**

3 **Drag the MacTCP file into the System Folder on your startup disk.**

This disk is now your MacTCP startup disk.

4 **If you received a Hosts file, drag it into the System Folder on your MacTCP startup disk.**

If your network administrator intends for you to customize the file, refer to the instructions in Appendix A, "Name-to-Address Mapping."

5 **If you received a MacTCP Token Ring Extension file, drag it into the System Folder on your MacTCP startup disk.**

6 **If you received a MacTCP Ping file, drag it onto your MacTCP startup disk.**

7 **Start up your computer from the newly created MacTCP startup disk.**

Choose Restart from the Special menu. The disk is ejected; then a disk icon with a blinking question mark appears. Reinsert the disk.

8 **Turn to Chapter 3, "Configuring MacTCP," to configure the software on your MacTCP startup disk.**

Installing both MacTCP and MacSNMP on a hard disk—version 7.x only

1 **Get the TCP/IP Connection software from your network administrator.**

Follow your network administrator's instructions for obtaining the TCP/IP Connection software.

2 **If you received a Hosts file, drag it into your System Folder.**

If your network administrator intends for you to customize the file, refer to the instructions in Appendix A, "Name-to-Address Mapping."

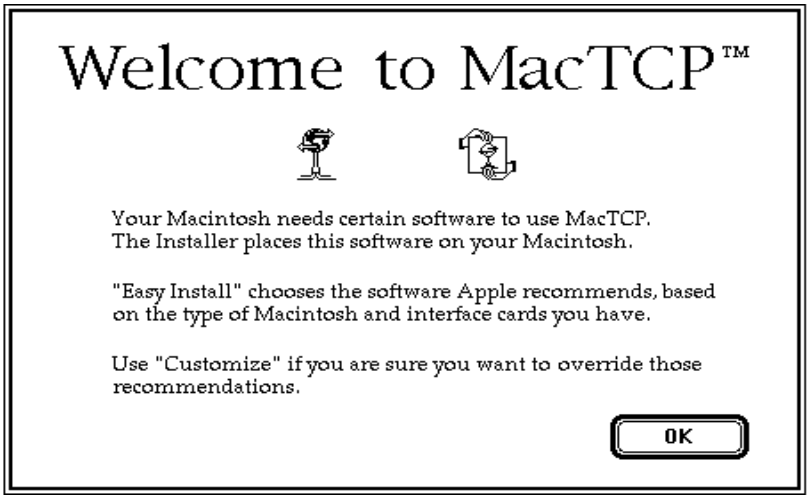
3 **If you received a MacSNMP Client file, drag it into your System Folder.**

A dialog box appears, asking if you want this control panel placed in the Control Panels folder. Click OK.

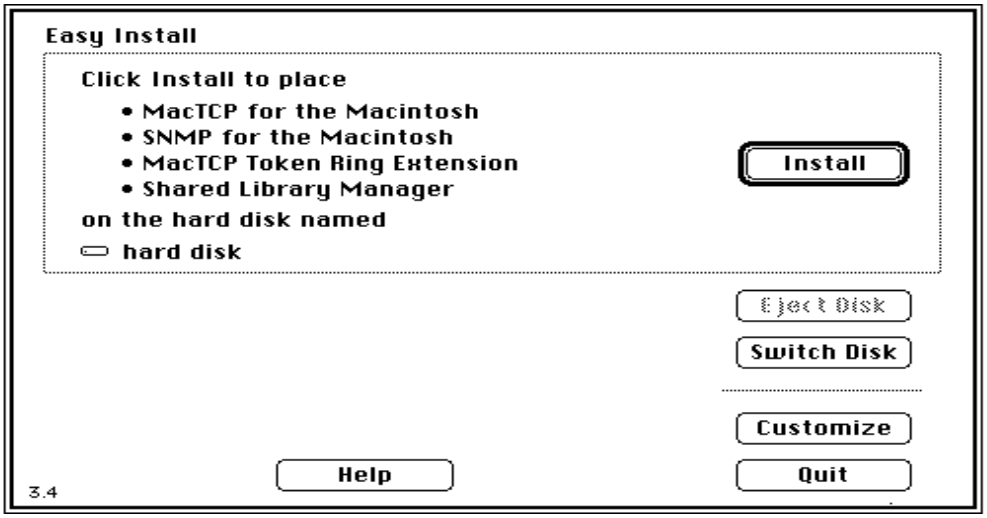
4 **If you received a MacTCP Ping file, drag it onto your hard disk.**

5 **Double-click the Installer icon to open the Installer program.**

The "Welcome to MacTCP" screen appears. Click OK.


Welcome to MacTCP™
Your Macintosh needs certain software to use MacTCP.
The Installer places this software on your Macintosh.
"Easy Install" chooses the software Apple recommends, based on the type of Macintosh and interface cards you have.
Use "Customize" if you are sure you want to override those recommendations.
OK

The Easy Install dialog box that appears next lists the software that the Installer will place on your hard disk.

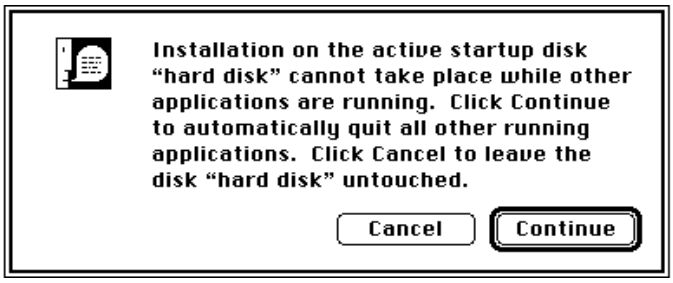


6 **Make sure that the hard disk indicated on the screen is your current startup disk.**

If another disk is currently selected, click the Switch Disk button until the name of your current startup disk appears.

7 **Click Install to install the software.**

8 **If you see a message indicating that the software cannot be installed on the current startup disk while other application programs are running, click the Continue button. (If you do not want to quit other open application programs, click the Cancel button.)**


Installation on the active startup disk "hard disk" cannot take place while other applications are running. Click Continue to automatically quit all other running applications. Click Cancel to leave the disk "hard disk" untouched.
Cancel
Continue

The Installer begins to install the selected software on your hard disk. On-screen messages report the progress of the installation.

9 **When you see a message reporting that the installation was successful, click the Quit button to exit from the Installer program.**

10 **Turn to Chapter 3, "Configuring MacTCP," to configure the MacTCP driver on your Macintosh computer.**

3 Configuring MacTCP

This chapter describes how to configure the MacTCP driver on a Macintosh computer. The configuration tools are described first, followed by instructions for performing either partial or full configuration. The chart in Figure 3-4 shows which sections of the chapter correspond to your level of configuration authority.

◆ **Note** Your network administrator may already have configured MacTCP, in which case you need only set the link level information for your computer. Check with your network administrator if you do not know the configuration status of your MacTCP driver software. ◆

Configuration tools in the MacTCP software

There are two configuration tools in the MacTCP software: the MacTCP control panel and the Administrator dialog box. How you use these tools depends on the level of configuration authority that has been assigned to you by the network administrator. Your network administrator can tell you which level has been assigned. A user who has been assigned partial configuration authority has use of the MacTCP control panel. This user can view the Administrator dialog box but cannot modify it. The user who has been assigned full configuration authority has full use of both the MacTCP control panel and the Administrator dialog box.

The MacTCP control panel

The top-level configuration tool is the MacTCP control panel. It is used to set link level information and to set the IP address in decimal notation.

The appearance of the MacTCP control panel differs in the 6.0.x and 7.x environments; however, the function remains the same.

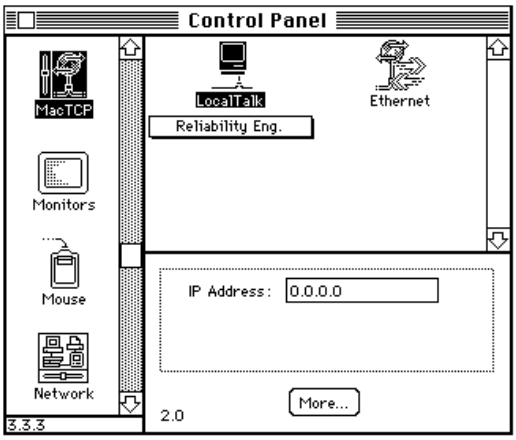


Figure 3-1 A view of the MacTCP control panel in version 6.0.x

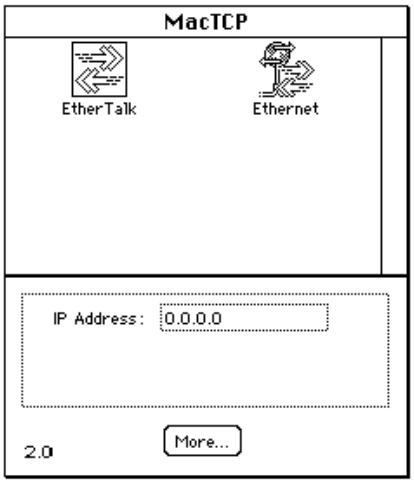


Figure 3-2 A view of the MacTCP control panel in version 7.x

The Administrator dialog box

The lower-level configuration tool is the Administrator dialog box, which is accessed through the More button on the MacTCP control panel. If you have been assigned partial configuration authority, your system has been set up so that you can view the Administrator dialog box but cannot enter or change any information. If you have been assigned full configuration authority, the Administrator dialog box is your main tool for configuring the MacTCP driver. The following sections describe the Administrator dialog box features.

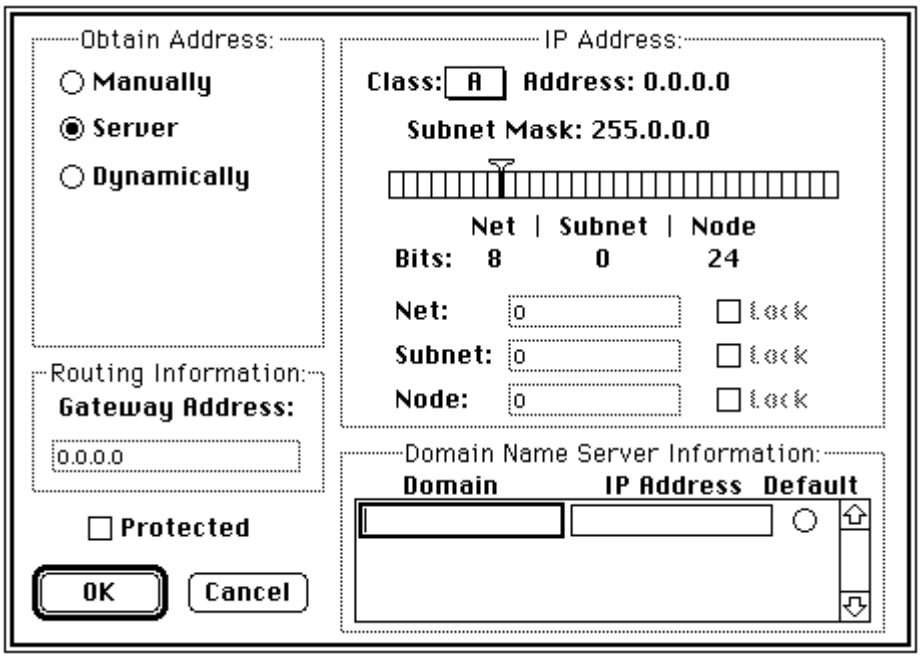


Figure 3-3 A view of the Administrator dialog box

Obtain Address box

This box indicates the method used to set the IP address. There are three options:

- *Manually*: All of the fields in the IP Address box are set manually.
- *Server*: The IP address for the user's Macintosh computer is automatically obtained from a server every time the user starts up the computer. This option requires a server that supports RARP or BootP in an Ethernet environment, or a MacIP-compatible Datagram Delivery Protocol-Internet Protocol (DDP-IP) gateway on an AppleTalk network system.
- *Dynamically*: The node portion of the IP address for the Macintosh is set dynamically every time the user starts up the computer.

IP Address box

This box indicates the IP address class, subnet mask, net, subnet, and node numbers.

Routing Information box

This box indicates the gateway address in dotted decimal notation.

Domain Name Server Information box

This box indicates the IP addresses of domain name servers and the domains over which they have authority.

MacTCP Prep configuration file

The MacTCP driver stores all configuration information within the driver itself, as well as in a file named MacTCP Prep. This file is automatically created by the MacTCP software if changes are made to the MacTCP configuration settings. If no changes are made, a MacTCP Prep file is not created.

If a MacTCP Prep file exists, the MacTCP software always takes configuration information from the prep file. If you update your system to a new version of the MacTCP driver and a MacTCP Prep file already exists, the current configuration is retained. If you receive a new version of the MacTCP driver that has been preconfigured and you want the new configuration settings, remove any existing MacTCP Prep file before you install the new driver. (In system software version 6.0.x, the MacTCP Prep file is stored in the System Folder; in version 7.x, MacTCP Prep is stored in the Preferences folder.)

The remainder of the chapter describes the steps you must take to configure the MacTCP driver. The chart in Figure 3-4 shows the chapter sections that correspond to your assigned level of configuration authority.

If your assigned configuration authority is . . .

Full authority	Partial authority	*. . . refer to these sections*
		Opening the MacTCP control panel
		Setting link level information
		Setting the IP address (MacTCP control panel)
		Viewing the Administrator dialog box
		Closing the control panel
		Using the Administrator dialog box
		Setting the IP address (Administrator dialog box)
		Setting the gateway address
		Setting domain name server information
		Closing the Administrator dialog box

Figure 3-4 A guide to MacTCP software configuration

The shaded areas indicate the sections of this chapter you should read for your level of configuration authority.

Opening the MacTCP control panel

This section describes how to configure the MacTCP driver using the MacTCP control panel. The way you open and use the MacTCP control panel differs in the system software version 6.0.x and version 7.x environments. Read the section that applies to your environment.

Version 7.x environment

Choose Control Panels from the Apple menu. The Control Panels window appears with a scrollable list of icons, as shown in Figure 3-5.

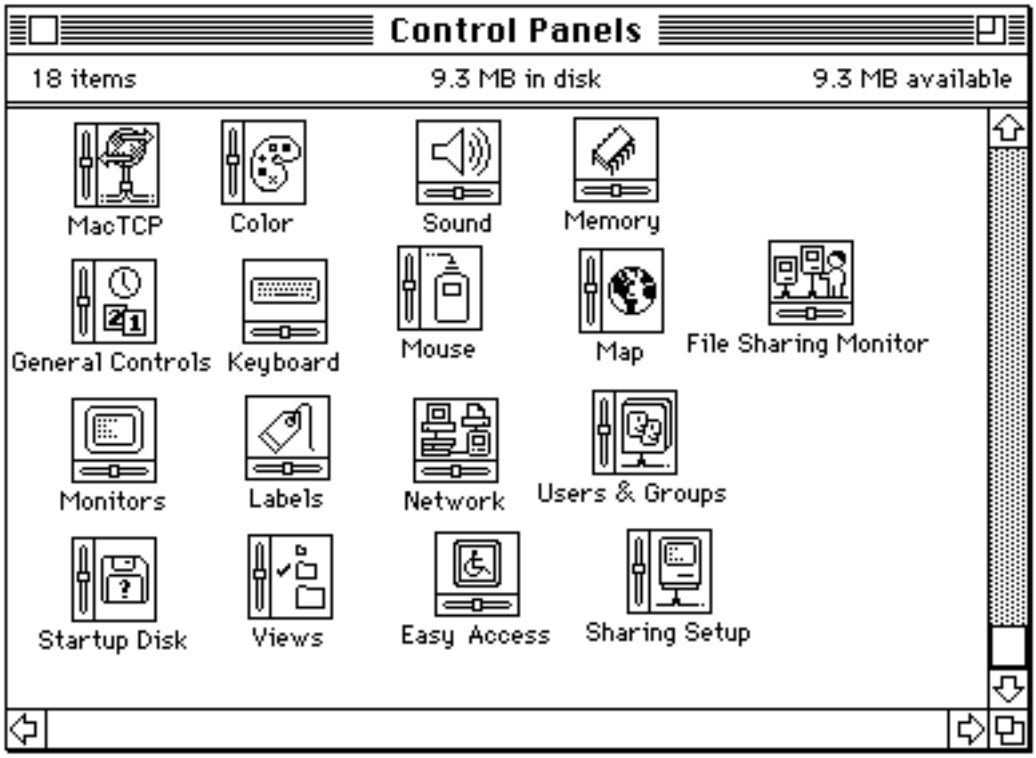


Figure 3-5 The Control Panels window in version 7.x

Click the MacTCP icon. (It may be necessary to use the scroll bar to bring the MacTCP icon into view.) The MacTCP control panel appears as shown in Figure 3-6.

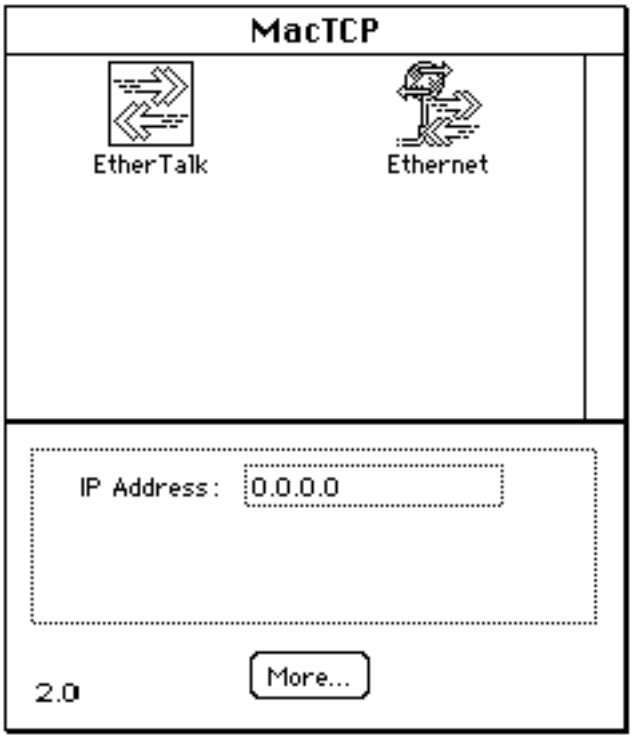


Figure 3-6 The MacTCP control panel in version 7.x

If your network administrator has given you partial configuration authority, you need only this control panel to configure your system. If you have full authority, you need to use this control panel to set your link information, but you may choose to enter the IP address information in the Administrator dialog box.

Version 6.0.x environment

Choose Control Panel from the Apple menu, and the panel appears with a scrollable list of icons at the left side of the window.

Click the MacTCP icon. (It may be necessary to use the scroll bar to bring the MacTCP icon into view.) A new display appears on the right three-quarters of the window as shown in Figure 3-7.

If your network administrator has given you partial configuration authority, you need only this control panel to configure your system. If you have full authority, you need to use this control panel to set your link information, but you may choose to enter the IP address information in the Administrator dialog box.

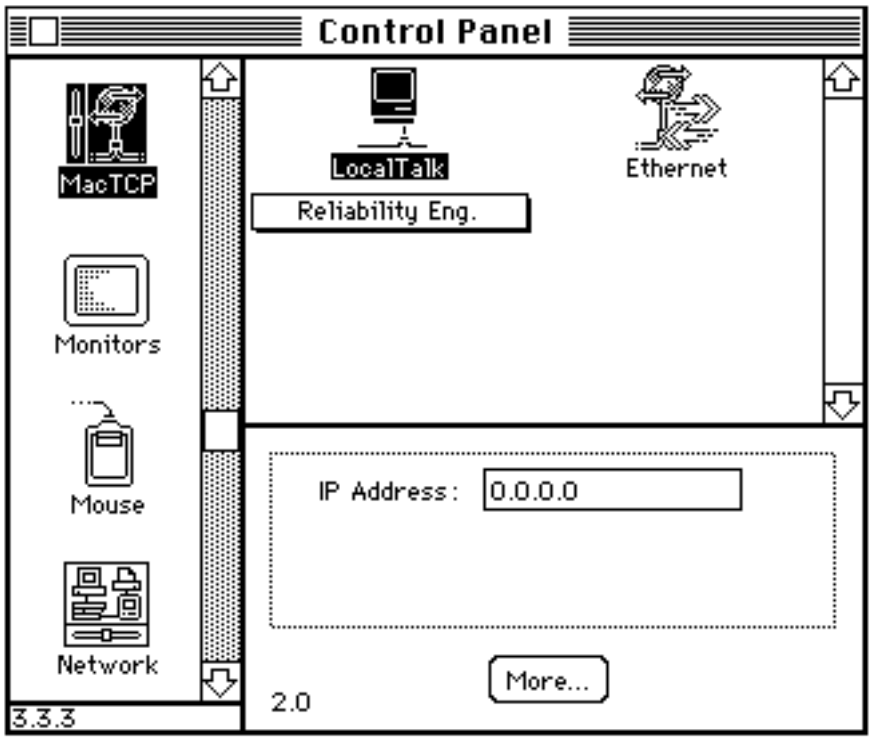


Figure 3-7 The MacTCP control panel in version 6.0.x

Setting link level information

The top half of the MacTCP control panel displays the available link level protocols on which the MacTCP driver can run. Different icons are displayed depending on your network configuration.

If your Macintosh computer is using an Ethernet interface card, make sure that the card's software is installed. The MacTCP control panel also provides a way for you to learn the hardware address of your Ethernet interface card if you should need this information for purposes of troubleshooting. Press and hold down the Option key and click the Ethernet icon. The hardware address of the card is displayed beneath the icon, as shown in Figure 3-8.

Figure 3-8 An Ethernet icon with the hardware address of the interface card displayed

Five possible network configurations are described on the following pages. Select the one that applies to your network, and follow the instructions to set the link level information.

◆ **Note** You may need to consult your network administrator to determine your network configuration and the zone where your DDP-IP gateway is located. ◆

Network configuration 1

Figure 3-9 illustrates one possible network configuration: a Macintosh computer on an AppleTalk network using LocalTalk cable with a gateway to an internet.

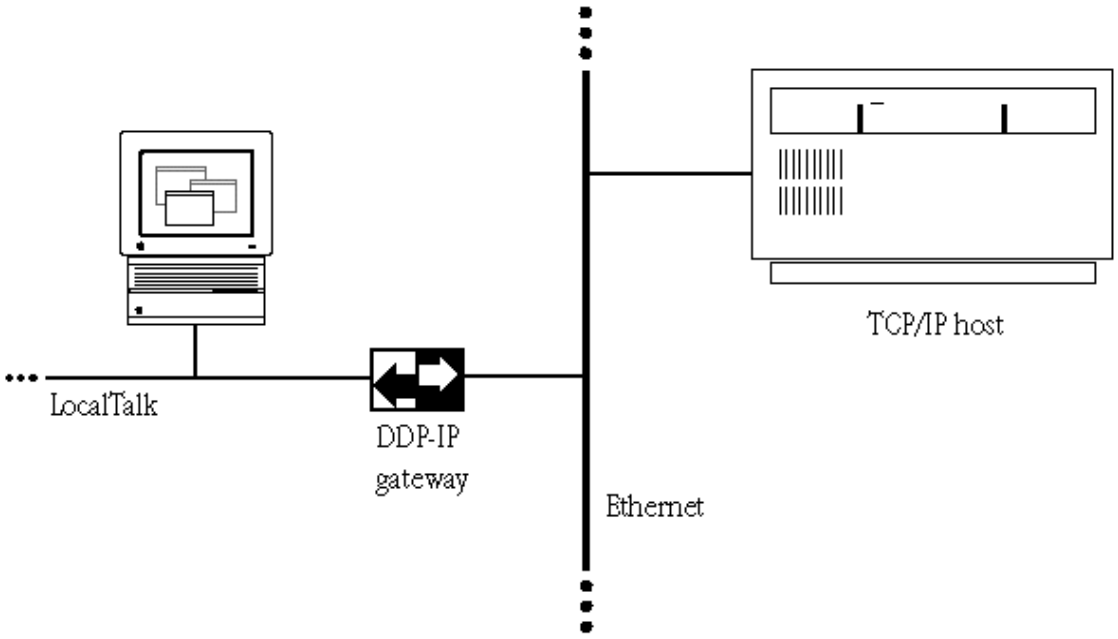


Figure 3-9 Network configuration 1

If this is your network configuration, the upper section of the MacTCP control panel contains the icon shown in Figure 3-10.

Figure 3-10 The icon displayed for network configuration 1

The box beneath the icon displays the network zone where your DDP-IP gateway is located. If your gateway is located in another zone, direct the pointer to the zone box beneath the icon and press the mouse button. A pop-up menu appears with a list of zone names, as shown in Figure 3-11. Holding the mouse button down, drag the pointer to the list and highlight the appropriate zone. When you release the mouse button, the pop-up menu disappears, and the zone name you selected appears in the box.

Figure 3-11 The zone pop-up menu

Network configuration 2

Figure 3-12 illustrates a second possible network configuration: a Macintosh computer with one Ethernet NB Card on an AppleTalk network using Ethernet cable.

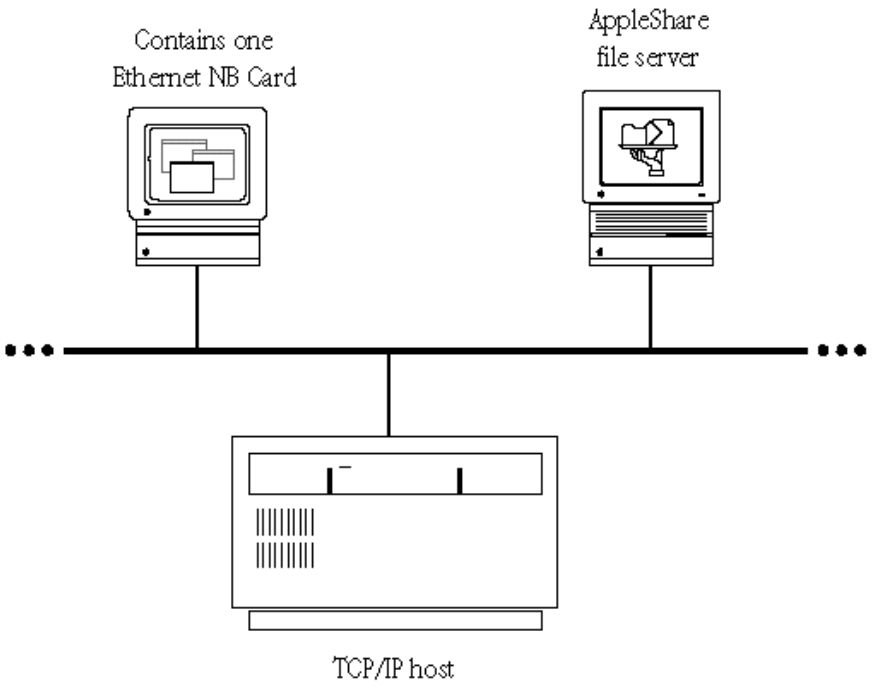


Figure 3-12 Network configuration 2

If this is your network configuration, the upper section of the MacTCP control panel contains the icons shown in Figure 3-13. Select the Ethernet icon to allow your Macintosh computer to use TCP/IP to communicate with other TCP/IP hosts on the network. (AppleTalk is already being used to communicate with the AppleShare file server and LaserWriter printer.)

Figure 3-13 The icons displayed for network configuration 2

Network configuration 3

Figure 3-14 illustrates a third possible network configuration: a Macintosh computer with two Ethernet NB Cards (located in slots 4 and 5) on an AppleTalk network using Ethernet cable.

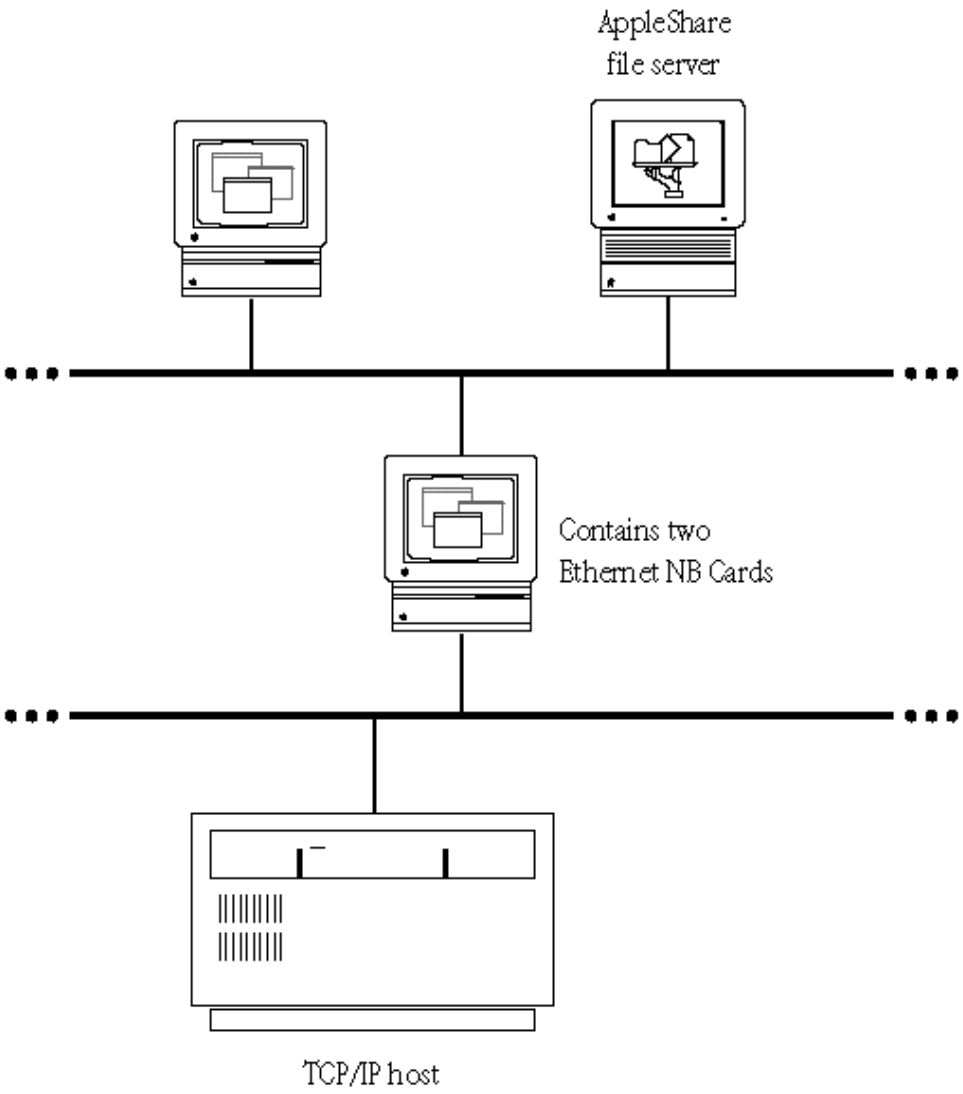


Figure 3-14 Network configuration 3

If this is your network configuration, the upper section of the MacTCP control panel contains the icons shown in Figure 3-15. (If the Ethernet NB Cards are located in slots other than 4 and 5, the numbers in the icon names will be different.) Select the Ethernet (5) icon to allow your Macintosh computer to use TCP/IP to communicate with other TCP/IP hosts on that network.

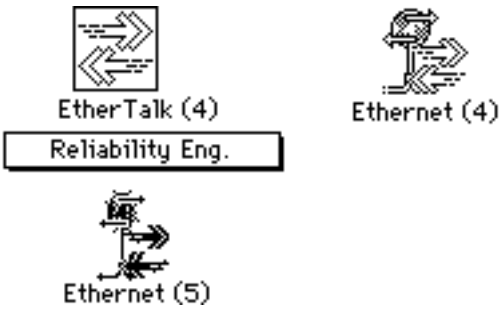


Figure 3-15 The icons displayed for network configuration 3

Network configuration 4

Figure 3-16 illustrates a fourth possible network configuration. Macintosh computers 1, 2, and 3 are on EtherTalk cable segments separate from the TCP/IP host. These computers use AppleTalk protocols to communicate with the gateway, and the gateway uses TCP/IP protocols to communicate with the TCP/IP host. Macintosh computer 4, on the same Ethernet network as the TCP/IP host, uses standard TCP/IP protocols to communicate directly with the TCP/IP host.

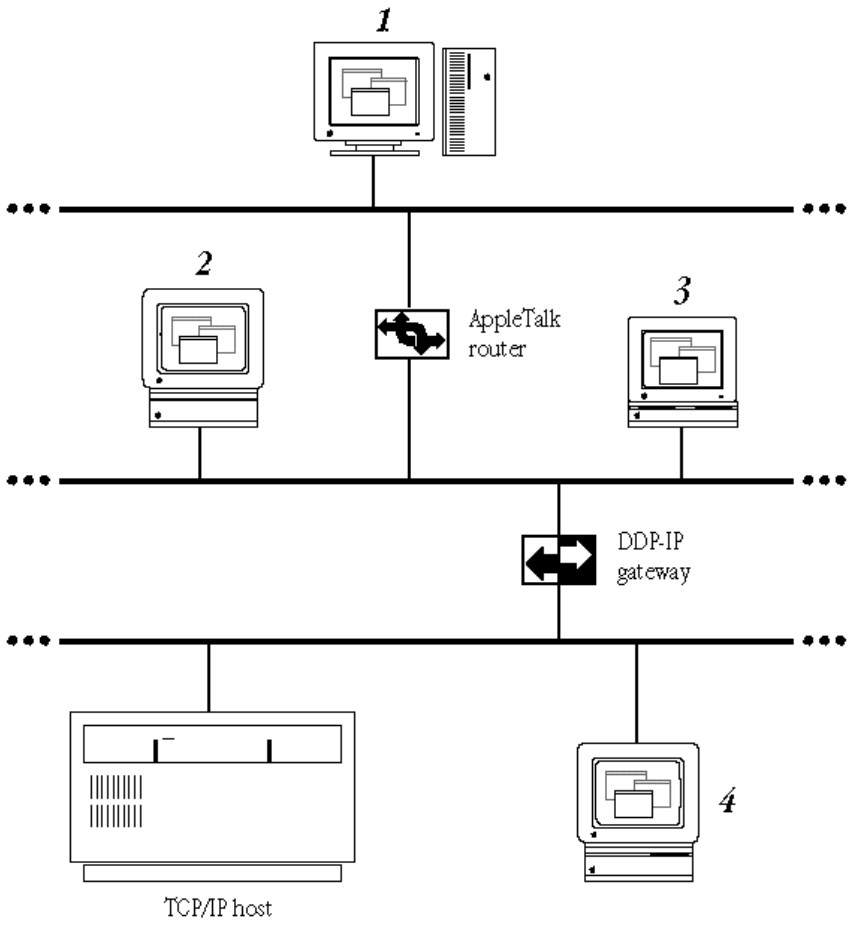


Figure 3-16 Network configuration 4

If this is your network configuration, the upper section of the MacTCP control panel contains the icons shown in Figure 3-17. If your computer must communicate through a gateway to reach a TCP/IP host (as computers 1, 2, and 3 do in Figure 3-16), make sure that the EtherTalk icon is selected. If you are on the same Ethernet as the TCP/IP host (as computer 4 is in Figure 3-16), select the Ethernet icon.

Figure 3-17 The icons displayed for network configuration 4

Network configuration 5

The following figure illustrates a fifth network configuration: A Macintosh computer on a Token Ring network, connected either to an IP host on the Token Ring network or to an IP host on an Ethernet network through an IP router or Ethernet-to-Token Ring bridge.

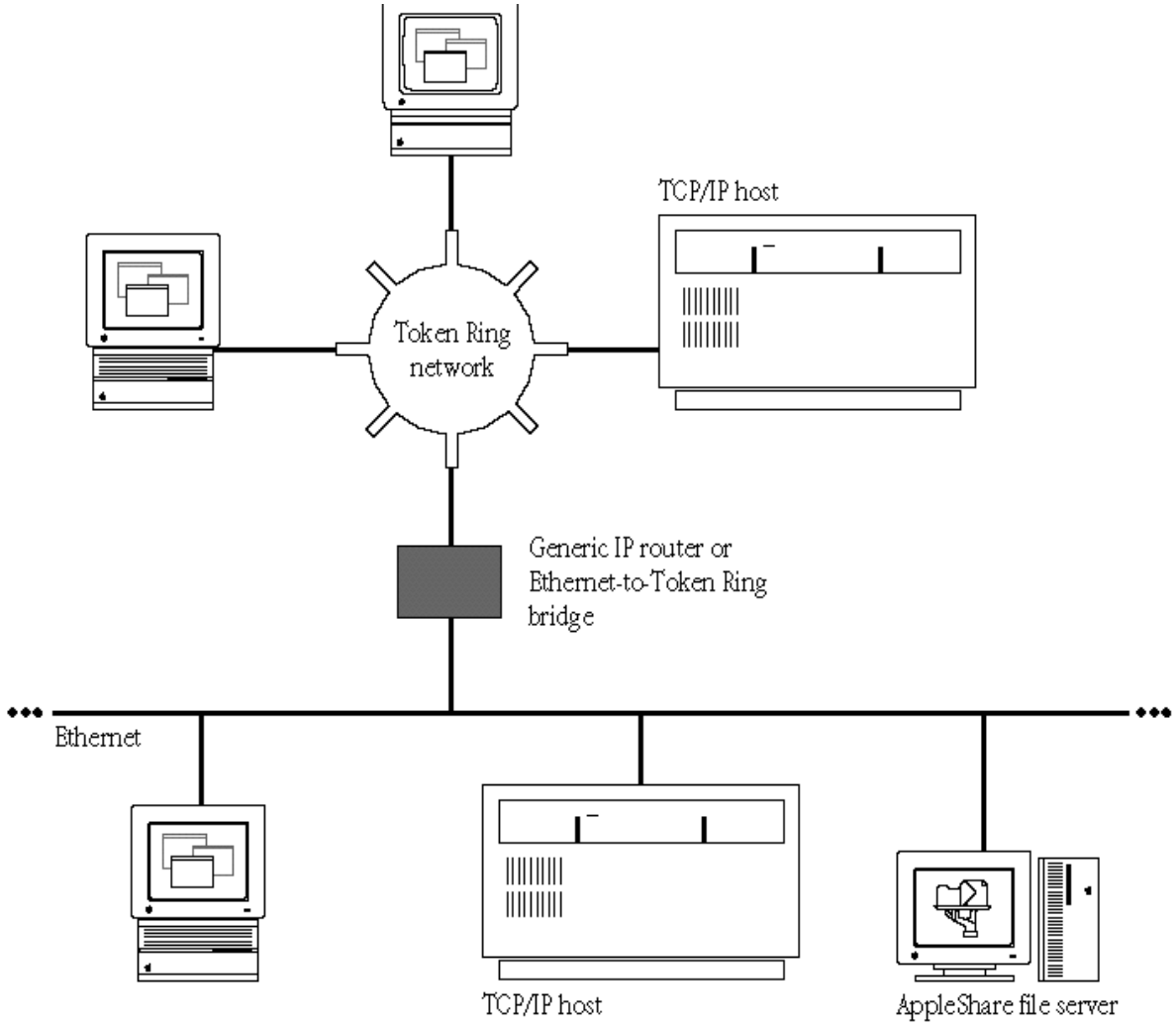


Figure 3-18 Network configuration 5

If this is your network configuration, the upper section of the MacTCP control panel contains the icons shown in Figure 3-19. Select the Token Ring icon to allow your Macintosh computer to use TCP/IP to communicate with other TCP/IP hosts on that network.

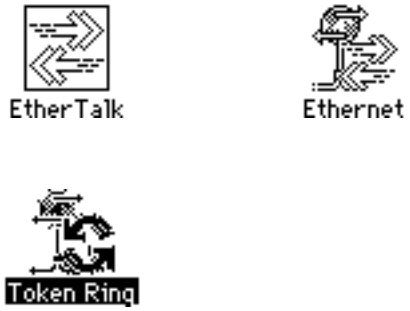


Figure 3-19 The icons displayed for network configuration 5

◆ **Note** If you have a Token Ring card installed in your computer, the Token Ring icon that appears in the MacTCP control panel includes the NuBus slot number. This number differs from the physical card slot number that is displayed in the Token Ring control panel. Figure 3-20 shows the Token Ring and MacTCP control panels for a Macintosh II computer with multiple Token Ring cards. Figure 3-21 maps the correspondence between the physical slot numbers shown in the Token Ring control panel and the NuBus slot numbers shown in the MacTCP control panel. ◆

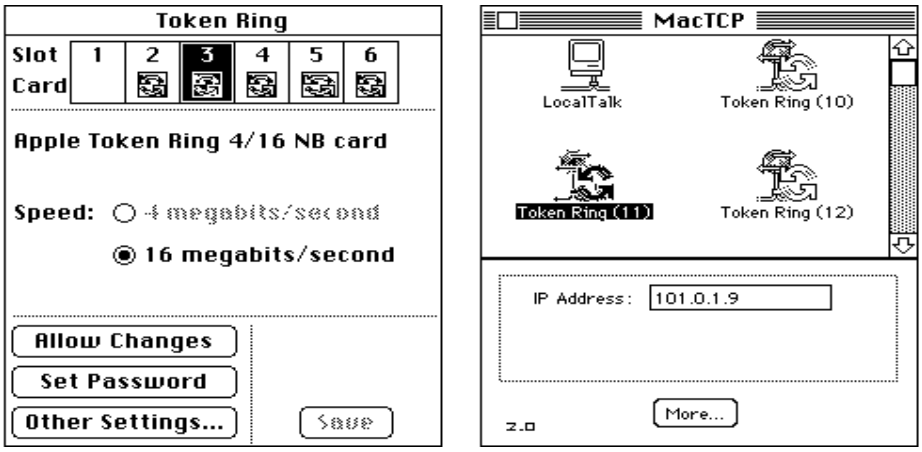


Figure 3-20 Multiple Token Ring cards in a Macintosh II computer, as seen in the Token Ring and MacTCP control panels

Computer model	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
Macintosh II	9	10	11	12	13	14
Macintosh IIx	9	10	11	12	13	14
Macintosh IIfx	9	10	11	12	13	14
Macintosh IIcx	9	10	11			
Macintosh IIci	12	13	14			
Macintosh Quadra 700	13	14				
Macintosh Quadra 900	10	11	12	13	14	

Figure 3-21 Physical slot numbers (shaded) and NuBus slot numbers in various Macintosh computers

Setting the IP address (MacTCP control panel)

The way your network administrator has configured the MacTCP driver determines the information that you enter in the IP address portion of the MacTCP control panel. There are four possibilities:

- The administrator has set the full IP address or has configured the MacTCP driver so that the address information is automatically assigned. In this case, the address appears in the IP Address box on the MacTCP control panel, and you don't have to set the address. You can skip to the section "Viewing the Administrator Dialog Box."
- The administrator has set the net and subnet portions of the address, and you must set the node number. Follow the instructions in the section "Setting the Node Number" later in this chapter.
- You must type the IP address in decimal notation. Follow the instructions in the later section "Setting the IP Address in Decimal Notation."
- The administrator has assigned you full configuration authority. You may either type the IP address (in decimal notation) in the MacTCP control panel now and skip ahead to the section "Using the Administrator Dialog Box," or skip ahead to that section now and type the IP address information there.

Setting the node number

If your administrator has configured the MacTCP driver so that all you have to do is type the node portion of the address, the IP Address box is displayed as shown in Figure 3-22. The Net and Subnet boxes contain numbers, but the Node box is set to 0. Double-click the Node box and type the node number. (Your administrator should provide you with this information.)

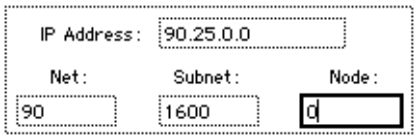


Figure 3-22 The screen section for setting the node number

The address displayed in the IP Address box changes to include the node portion of the address if you select the More button and then return to the MacTCP control panel or if you close the control panel and then open it again. You cannot directly change the address in the IP Address box.

After you have typed the node portion of the address, skip to the section "Viewing the Administrator Dialog Box."

Setting the IP address in decimal notation

If you have been assigned partial configuration authority and your administrator has configured the MacTCP driver so that you must set the IP address in dotted decimal notation, an IP Address box is displayed as shown in Figure 3-23. Click in the box and type the address. (Your administrator should provide you with this information.) Then move to the next section,"Viewing the Administrator Dialog Box."

If you have been assigned full configuration authority and have decided to set the IP address in the MacTCP control panel, click in the box and type the address. Then move to the section "Using the Administrator Dialog Box."

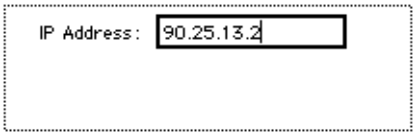


Figure 3-23 The IP Address box

Viewing the Administrator dialog box

If you have been assigned partial configuration authority, your system has been set up so that you cannot change the information in the Administrator dialog box. However, if you want to view this panel, click the More button on the MacTCP control panel. The Administrator dialog box appears with the fields dimmed, as shown in Figure 3-24.

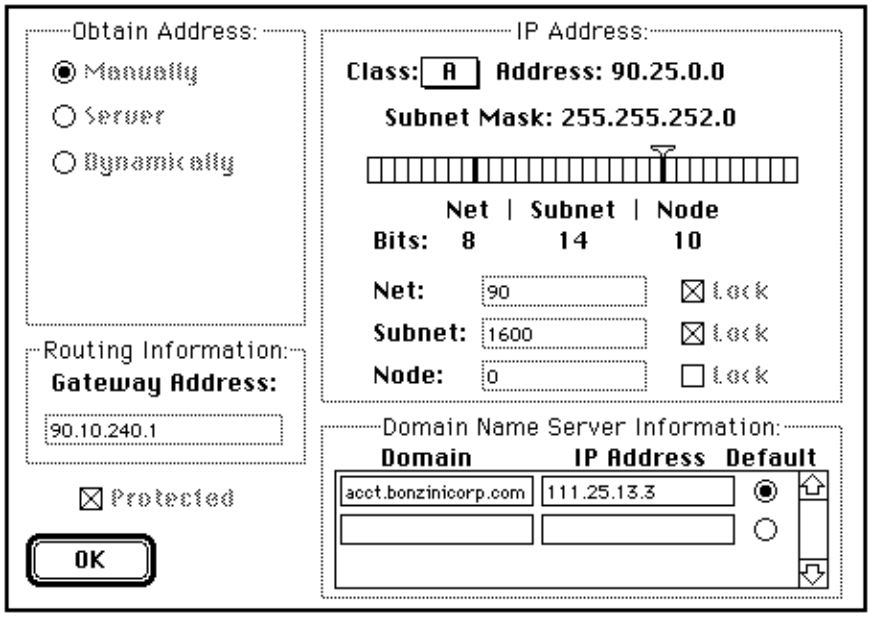


Figure 3-24 The Administrator dialog box with dimmed fields

Click the OK button when you finish viewing the Administrator dialog box. The MacTCP control panel reappears.

Closing the control panel

If you have partial configuration authority and have entered the appropriate information in the MacTCP control panel, you have finished configuring the MacTCP driver. The configuration settings are stored in the MacTCP driver and also in a file called MacTCP Prep.

Click the close box to close the control panel window. The configuration changes take effect the next time the driver is used. If the configuration changes cannot be made immediately, the alert message shown in Figure 3-25 is displayed.

Figure 3-25 The alert box

This message informs you that you must restart your Macintosh computer for the configuration changes to take effect. When you click the OK button, the control panel closes. When you restart, MacTCP is configured on your computer.

Using the Administrator dialog box

If you have full configuration authority, the Administrator dialog box is your main tool for configuring the MacTCP driver. Click the More button to get to the Administrator dialog box shown in Figure 3-26.

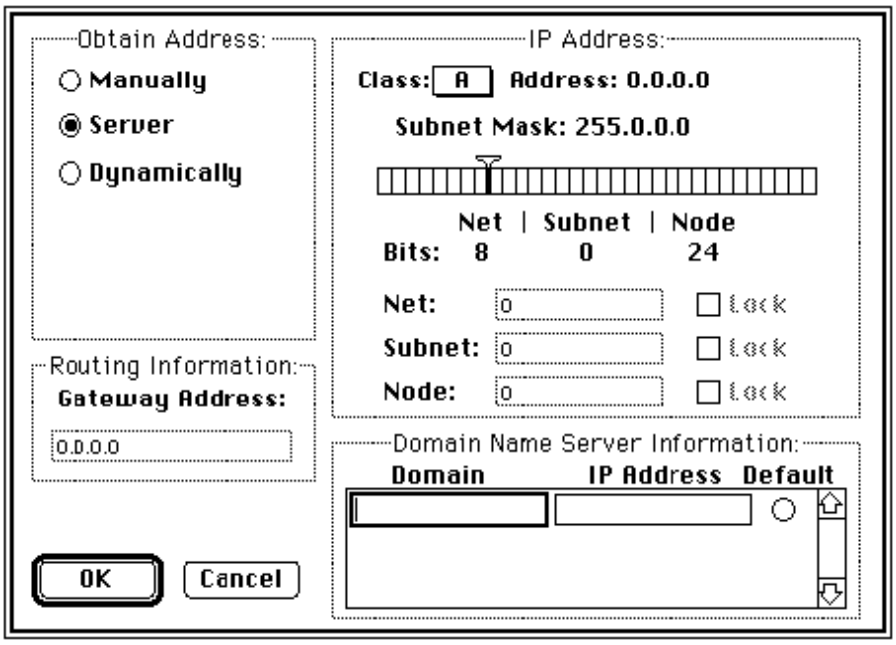


Figure 3-26 The Administrator dialog box

Setting the IP address (Administrator dialog box)

If you did not set the decimal address in the MacTCP control panel, the Administrator dialog box provides you with three ways to set the IP address. The Obtain Address box in the upper-left corner of the panel (shown in Figure 3-27) allows you to select your preferred method for setting the address.

- If you select Manually, you must set the address manually using the fields in the IP Address box. See the next section, “Setting the Address Manually.”

- If you select Server, the address is obtained automatically from a server. This option requires a server that supports RARP or BootP in an Ethernet environment, or a MacIP-compatible Datagram Delivery Protocol-Internet Protocol (DDP-IP) gateway on an AppleTalk network. See the section “Obtaining an Address from a Server” later in this chapter.
- If you select Dynamically, you must set the net and subnet portions of the address using the fields in the IP Address box, but the node portion of the address will be allocated dynamically within the range of node numbers specified. See the section “Setting the Node Number Dynamically” later in this chapter.

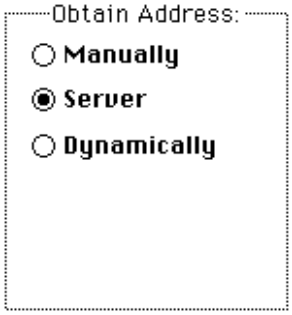


Figure 3-27 The Obtain Address box

Setting the address manually

To set the address manually, click the Manually button located in the Obtain Address box. Then follow the steps described in the following sections.

Setting the address class

Move to the IP Address box and position the pointer on the Class box. Class A, the default setting, is currently shown in the box. Press the mouse button and a menu of classes appears as shown in Figure 3-28. The ✓ indicates which class is the current setting. If you want to change the class, press the mouse button as you drag the pointer to B or C.

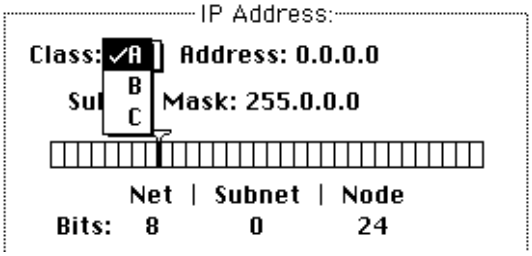
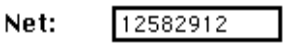


Figure 3-28 The menu of address classes

If you change the class, the new value that appears in the Net box is the minimum value allowable for the selected address class. For instance, if you select class C, the value in the Net box changes to 12582912, which is the minimum value that can be used for class C addresses.



Note that changing the class causes the slider on the ruler to move. The address, subnet mask, and bits allocated to net, subnet, and node also change. Figure 3-29 shows the address, subnet mask, position of the slider, and the bit allocation for each class selection.

Class: A Address: 0.0.0.0
Subnet Mask: 255.0.0.0
Net | Subnet | Node
Bits: 8 0 24
Class: B Address: 128.0.0.0
Subnet Mask: 255.255.0.0
Net | Subnet | Node
Bits: 16 0 16
Class: C Address: 192.0.0.0
Subnet Mask: 255.255.255.0
Net | Subnet | Node
Bits: 24 0 8

Figure 3-29 Settings for classes A, B, and C

Setting the subnet mask

Perform this step only if you have implemented subnet addressing on your network. Use the slider on the ruler to set the subnet mask. Each box in the ruler represents one bit of the 32-bit IP address. A dark line on the ruler indicates the number of bits allocated to the net portion of the address (as determined by the class selected). The slider can be moved anywhere along the ruler to the right of this darkened line. Place the pointer on the slider, press the mouse button, and drag the slider to the appropriate location on the ruler. When you move the slider, the subnet mask, the subnet bits, and the node bits change.

If you do not move the slider, the Subnet box remains dimmed.

Setting the IP address (integer format)

In integer format, the IP address is broken down into bits (4 sets with 8 bits per set). The bits are allocated to net, subnet, and node according to address class and subnet mask, then displayed as a decimal number. For instance, the address 90.25.3.240, broken down into bits, looks like this: 01011010.00011001.00000011.11110000

If the address class is A (8 bits compose the net portion of the address) and the subnet mask is 255.255.252.0 (or 14 bits of subnet and 10 bits of node), then the integer form of the address is as follows:

- Net : 90
- Subnet : 1600
- Node: 1008

If you want to set the IP address in integer format, type this information in the Net, Subnet, and Node boxes as shown in Figure 3-30.

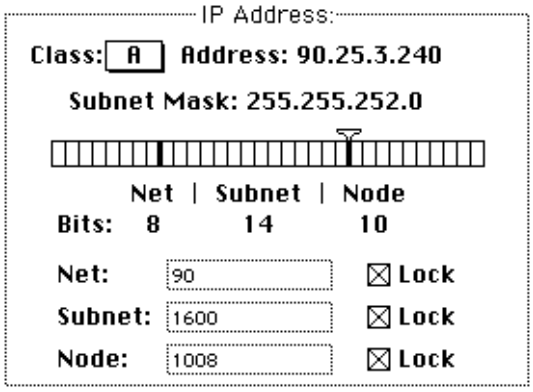


Figure 3-30 Values set in the Net, Subnet, and Node boxes

Setting the net number The Net box contains the lowest net number that can be used, determined by the address class that was selected. Click twice in the Net box and type the net portion of the IP address in integer form. If you try to type a number over the maximum allowed for the selected IP address class, the last digit in the number you typed is rejected; you must retype a valid number. If you type a number under the minimum allowed for the selected IP address class, a valid number is automatically assigned when you save your changes; therefore, be sure to type a number over the minimum allowed for the selected IP address class.

If you click the Lock box to the right of the Net box, the net number is protected. The Net box is dimmed, and you cannot change its value unless you click the Lock box again to deselect it.

Setting the subnet number Note that you can set the subnet number only if you set the subnet mask. Click the Subnet box and type the subnet portion of the IP address in integer format. If you click the Lock box to the right of the Subnet box, the subnet number is protected. The Subnet box is dimmed, and you cannot change the value in the box unless you click the Lock box again to deselect it.

Setting the node number You now have two choices: set the node number, or have the node number assigned dynamically.

If you decide to set the node number, click the Node box and type the node portion of the IP address in integer format. If you click the Lock box to the right of the Node box, the node number is protected. The Node box is dimmed, and you cannot change the value in the box unless you click the Lock box again to deselect it.

If you want the node number to be assigned dynamically every time the Macintosh starts up, see the section "Setting the Node Number Dynamically" later in this chapter.

Figure 3-30 shows values set and locked in the Net, Subnet, and Node boxes.

Obtaining an address from a server

If you select the Server button in the Obtain Address box, the network address is obtained automatically from a network server. On an Ethernet network, the protocols BootP or RARP are used to assign an address. On an AppleTalk network, a DDP-IP gateway sets the address.

To have a server provide the address, click the Server button in the Obtain Address box. (When you bring up the Administrator dialog box for the first time, Server is the default setting). There is no need to set class, subnet mask, or net, subnet, or node numbers; they will be set by the server. The Macintosh computer that uses this configuration is assigned an address every time it starts up, as long as you have a properly configured server.

After you restart your computer, the class, subnet mask, and net, subnet, and node numbers assigned by the server are reflected in the Administrator dialog box and in the IP Address box on the MacTCP control panel.

Setting the node number dynamically

If you select Dynamically in the Obtain Address box, the node portion of the IP address is assigned dynamically when you start up the computer.

An IP address has a range of valid node numbers that are determined by the address class and subnet mask. With dynamic addressing, MacTCP software randomly selects a node address in that range and, using Address Resolution Protocol (ARP), broadcasts a message to other nodes on the network, asking if there is another node using the address. If there is no response, the node number is assigned to your computer; if there is a response, the software rebroadcasts until it finds a number that is not being used by other machines on the network.

To use dynamic addressing, set the address class, subnet mask, and net and subnet numbers as described in the earlier section "Setting the Address Manually." Click on the Dynamically button (located in the Obtain Address box). Two boxes appear in the bottom half of the Obtain Address box, as shown in Figure 3-31, that indicate the range of valid node numbers (determined by the address class and subnet mask). After changes made to the Administrator dialog box are saved, a node number is assigned dynamically when the Macintosh computer is restarted.

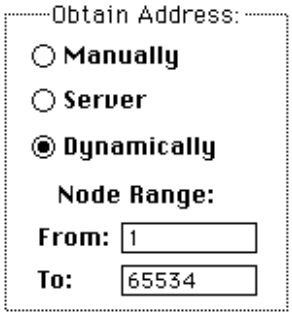


Figure 3-31 The Node Range boxes

If you know there are static addresses on your network, you can change the values in the Node Range boxes so that the addresses in the static range are not used. To change the minimum range value, double-click the From box and type an appropriate number. To change the maximum range value, double-click the To box and type an appropriate number.

Setting the gateway address

Some gateways use the Routing Information Protocol (RIP) to exchange network routing information. The MacTCP software automatically monitors RIP traffic to determine active gateways. If your network does not use RIP, you must manually set the address of a gateway.

◆ **Note** The default gateway address can also be configured from a server using the BootP protocol. ◆

To set the gateway address manually, go to the Routing Information section of the Administrator dialog box. Click the pointer in the Gateway Address box and type the decimal IP address of your gateway, as shown in Figure 3-32.

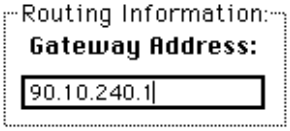


Figure 3-32 The gateway IP address in the Routing Information box

Setting domain name server information

This part of the Administrator dialog box allows you to set the IP address of domain name servers and the domains over which they have authority. The box allows you to set this information for your network's domain name server and other domain name servers on the internet.

Click the pointer in the Domain box and specify a domain name. Press the Tab key to move the pointer to the IP Address box, and type the address of that domain. As you type the IP address, additional boxes appear (shown in Figure 3-33) to allow you to enter more domain name server names and IP addresses.

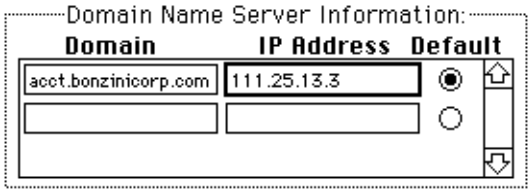


Figure 3-33 Domain name server information

Click the Default button to designate your default domain name server and your domain name extension. Generally, the default should be a domain name server that has authority over your domain.

Domain Name Resolver operation

This section describes how the domain name server list is used when making domain name server queries.

If a default name extension and server are identified in the Administrator dialog box, they are used for all nonqualified requests. For example, if the name homer is passed to the Domain Name Resolver (DNR) and the default extension is pundit.edu, the name homer.pundit.edu is used in the query; however, if the name homer.drama.pundit.edu is passed to the DNR, the extension is not appended.

The extension of the name passed to the DNR determines which name servers are chosen. Servers that match the full extension are found first, followed by servers that serve the ancestor of the full extension. For example, for the name homer.drama.pundit.edu, the server that serves drama.pundit.edu would be found first, followed by the server that serves pundit.ed. If no servers are found, the default server is used. If you did not set a default, the DNR returns noNameServer. In the Administrator dialog box, you should type a default domain name and select the Default button.

Once a list of servers that support the domain is found, those servers are queried in the order of their distance from the querying host. First servers on the local network are queried, followed by servers on other networks.

Closing the Administrator dialog box

When you have finished entering the appropriate information in the Administrator dialog box, the MacTCP driver is configured. The configuration settings are stored in the MacTCP driver and also in a file called MacTCP Prep.

Click the OK button in the Administrator dialog box to close it, and then click the close box to close the control panel. The configuration changes take effect the next time the driver is used. If the configuration changes cannot be made immediately, the alert message shown in Figure 3-34 is displayed.

Figure 3-34 The alert box

This message alerts you that you must restart your Macintosh computer for the configuration changes to take effect. When you click the OK button, the MacTCP control panel closes. When you restart, the MacTCP driver is configured on your computer.

What to do next

You have now successfully installed and configured the MacTCP driver on your Macintosh computer. Consult your network administrator if you have any questions about running network applications.

4 Using MacSNMP Client

This chapter provides instruction on how to use the MacSNMP Client application on a networked Macintosh to perform basic tasks such as setting a location, sending a message to the network administrator, and importing a community. The chapter also describes how to view Management Information Base (MIB) variables.

Performing MacSNMP client tasks

The MacSNMP Client application lets you perform a set of tasks that will aid the administrator in managing the network. At the administrator's request you will use the MacSNMP Client application to supply information about your location or to import a new or modified community. In addition, you can use the application to send messages to the administrator.

If you are uncertain about using the MacSNMP Client application, contact your administrator.

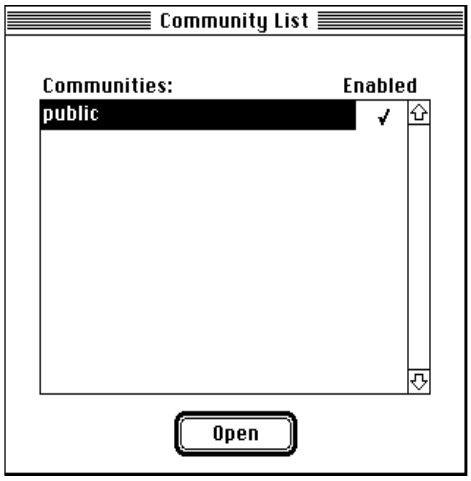
Setting your location

Your network administrator may ask you to supply more information about the location of your Macintosh computer.

Follow these steps to provide your network administrator with information about the location of your Macintosh computer:

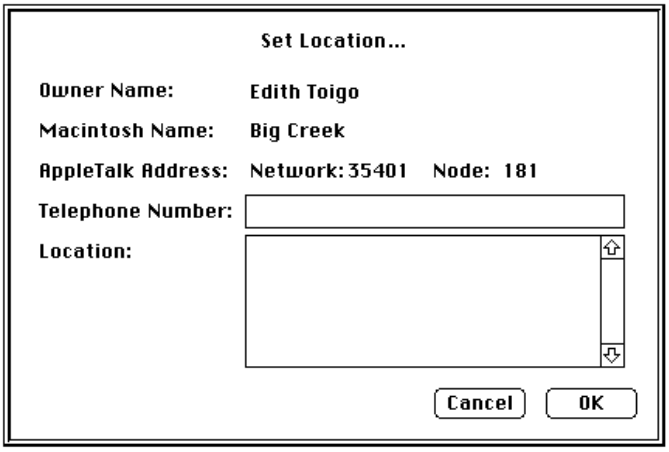
1 **Double-click on the MacSNMP Client application to open it.**

The client application starts and displays the Community List window.



2 **Choose Set Location from the Control menu.**

The Set Location dialog box appears, displaying information about the Macintosh running the client software and providing fields for entering additional information.



3 **In the Telephone Number text box, type your telephone number.**

4 **In the Location text box, type the location of your Macintosh computer.**

Try to be as descriptive as possible. Include such information as the building, floor, and wing (such as east or west) that your computer is on and, if appropriate, the number assigned to your cubicle or office. You can type up to 255 characters.

5 **Click OK to save the entries.**

◆ **Note** MacSNMP uses the Owner Name and Macintosh Name defined in the Sharing Setup control panel (accessible from the Apple menu). If these two fields are empty, open the Sharing Setup control panel to fill in this information. The AppleTalk address is provided automatically. ◆

6 **Choose Quit from the File menu to leave the MacSNMP application.**

Sending a message

You can use the MacSNMP Client application to send messages to the network administrator's console. This feature is useful for reporting computer and network problems that need to be corrected quickly.

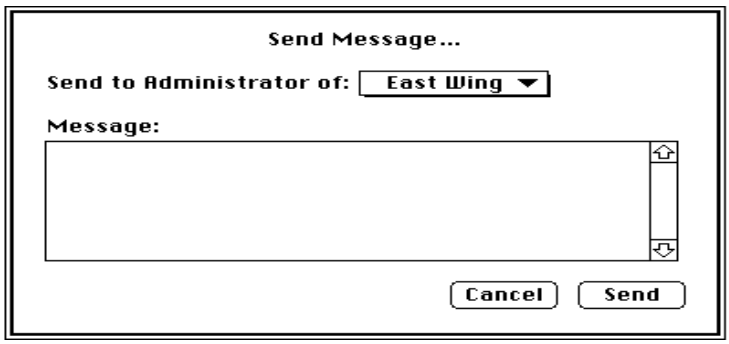
Follow these steps to send a message to your network administrator:

1 **Double-click on the MacSNMP Client application to open it.**

The client application starts and displays the Community List window:

2 **Choose Send Message from the Control menu.**

The Send Message dialog box appears.



◆ **Note** If, instead of seeing the Send Message dialog box, you see a dialog box saying that you cannot send a message because there are no recipients available, then your administrator has not registered the console name within MacSNMP. Contact your network administrator for assistance. ◆

3 **Choose the name of the administrator's console from the "Send to Administrator of" pop-up menu.**

4 **In the provided text area, type the message.**

You can type up to 255 characters.

5 **Click Send.**

The message is sent immediately to the specified administrator's console.

6 **Choose Quit from the File menu to leave the MacSNMP application.**

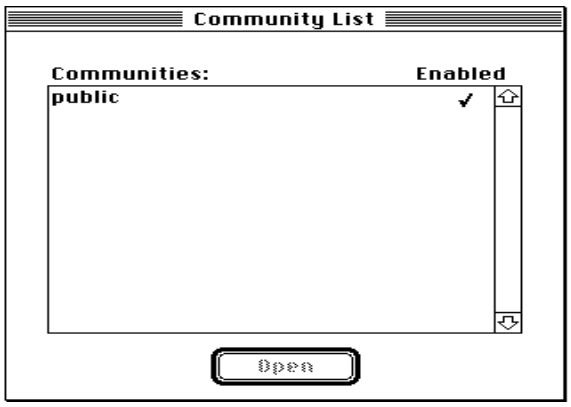
Importing a community

Your network administrator may ask you to import a MacSNMP file called a community to your Macintosh. The community can be stored on a floppy disk, a file server, or a shared disk (such as the administrator's hard disk). If the file is located on a file server or shared disk, make sure you are connected to the server or shared disk on which your network administrator has saved the community.

Follow these steps to import a community:

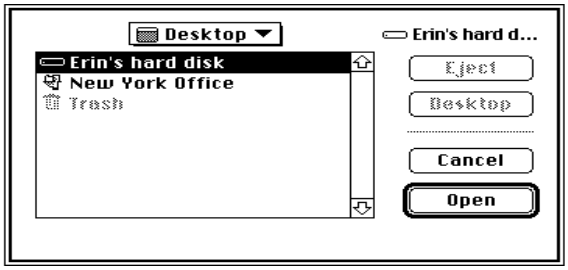
1 **Double-click on the MacSNMP Client application to open it.**

The client application starts and displays the Community List window:



2 **Choose Import Community from the File menu.**

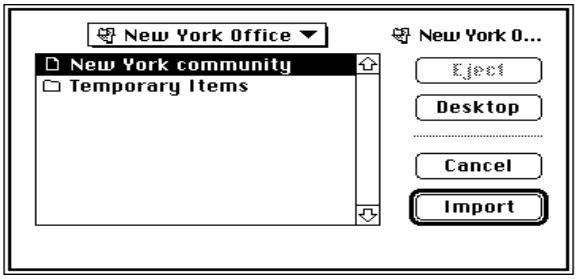
A directory dialog box appears, providing a list of folders and community files on the disk in use.



3 **Select the location (disk and folder) from which you want to import the community, then click Open.**

4 **If necessary, scroll to locate the community, then click its name to select it.**

When a community is selected, the Open button becomes the Import button.



5 **Click Import to import the selected community.**

◆ **Note** If the community name already exists on your computer, you will be asked whether you want to replace this existing community. Click the Replace button. The community you selected is imported onto your Macintosh computer. ◆

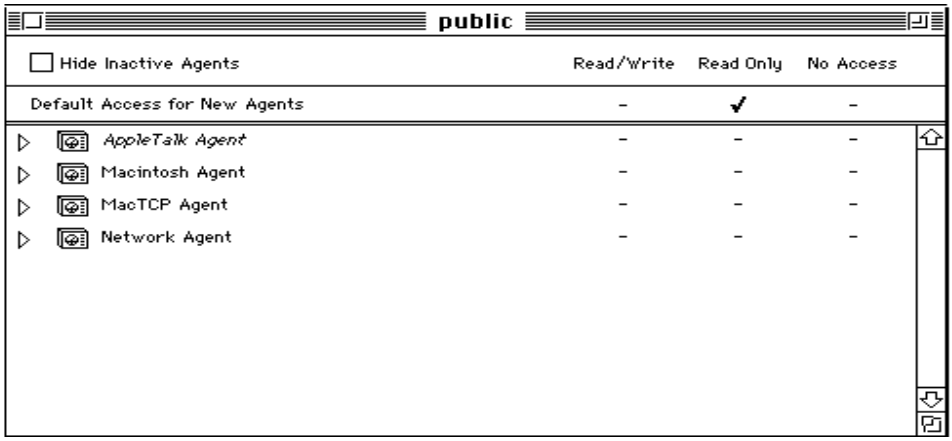
Viewing MIB variables

You can use MacSNMP Client to view Management Information Base (MIB) variables that are exported by the various agents on the system.

Follow these steps to view MIB variables:

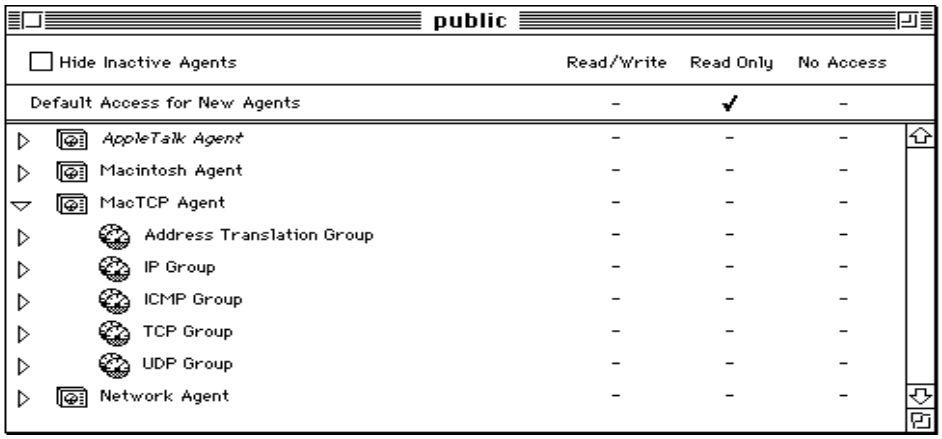
1 **Double-click on the MacSNMP Client application to open it. A list of available communities is displayed.**

2 **Select and open the public community. A window showing the available agents is displayed.**

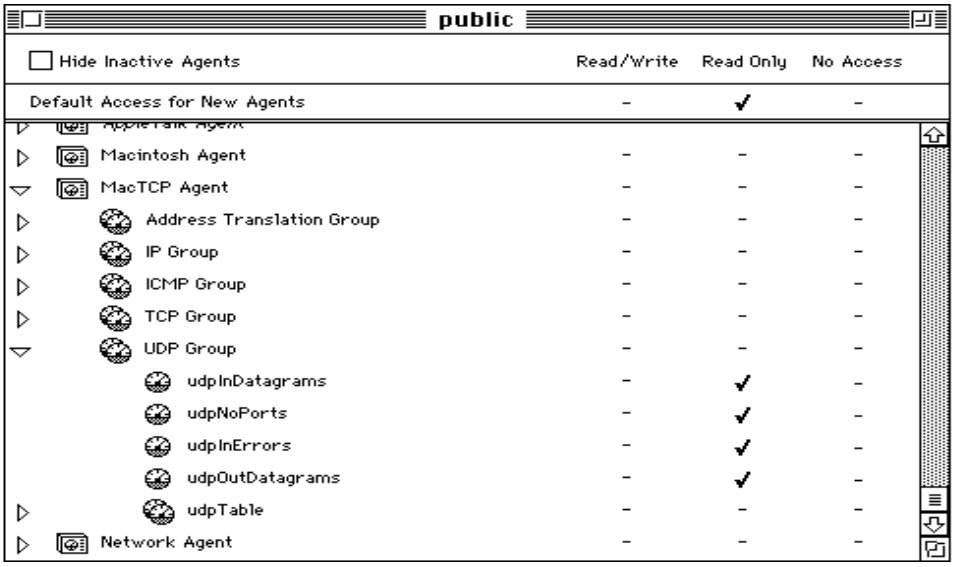


The MacTCP Agent supports the Address Translation, IP, ICMP, TCP, and UDP groups specified in Request for Comment 1213 (RFC 1213), “Management Information Base for Network Management of TCP/IP-based Internets: MIB-II.” The Network Agent supports the System, Interface, and SNMP groups.

3 **Click the triangle to the left of an agent to see the groups in that agent.**

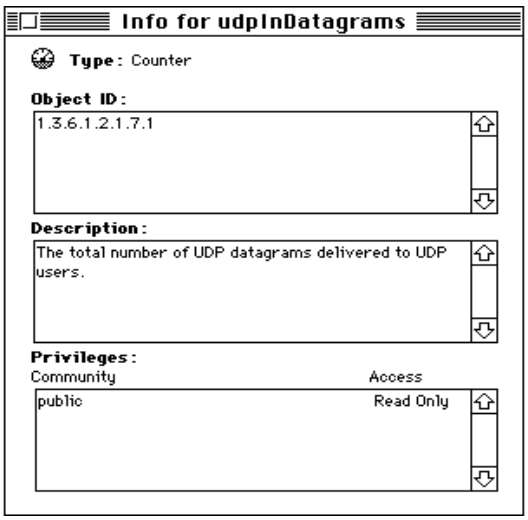


4 **Click the triangle to the left of a particular group to view all the variables within that group. Variables within a group can also be tables, which can subsequently be opened within a group.**

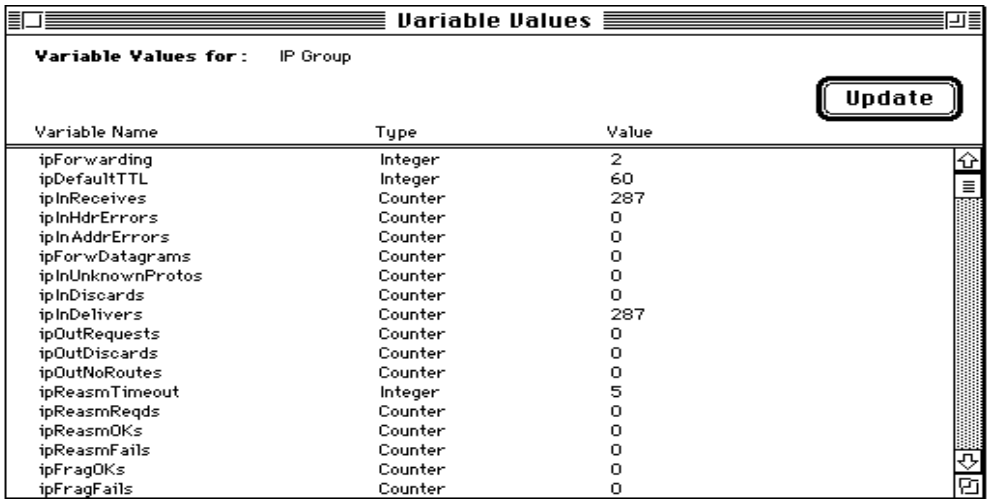


5 **To view information on a particular agent, group, table, or variable, select the item, then press and hold down the key and press the I key.**

The Object ID field displays the numerical identifier of the item. The Description field displays a short explanation of the selected item. The Privileges field displays the access privileges.



6 **To view the values of each individual variable for an agent, group, table or variable, double-click the item.**



◆ **Note** In addition to network and MacTCP agents, the TCP/IP Connection product includes an agent for the Macintosh. The Macintosh agent shows many of the system parameters and values of the Macintosh on which the agent is installed, including all the NuBus cards that are installed, the SCSI devices that are attached, and the applications that are installed on the system. ◆

Appendix A: Name-to-Address Mapping

The MacTCP software includes a Hosts file that maps machine names to internet addresses, the same service provided by the domain name system. You can use the Hosts file if there is no domain name server on your network. It is also convenient to place frequently used name-to-address mappings in this file.

To use the Hosts file, you must edit the sample file that is included with the MacTCP software and add text that defines name-to-address mappings. Each computer on your network that uses Hosts file services must have the file resident on the startup disk.

This appendix describes the syntax of the Hosts file and how to edit it.

Hosts file syntax

The Hosts file syntax conforms to the master file syntax specified in Request for Comment (RFC) 1035. Refer to this RFC for more information.

◆ **Note** $INCLUDE has not been implemented. ◆

The syntax of the Hosts file is as follows:

```
<name>    <type>    <data>      [;<comment>]
```

- `name` is the name assigned to a host or domain on the internet.
- `type` is A (address), NS (name server), or CNAME (canonical name).
- `data` is determined by the type specified:
  - If `type` = `A`, the data field contains an internet address.
  - If `type` = `NS`, the data field contains the name of the domain name server that has authority over the domain specified in the name field.
  - If `type` = `CNAME`, the data field contains the canonical (or official) name for the name field.
- `comment` allows you to add a comment to the entry. A semicolon is used to set off a comment.

Any combination of tabs and spaces can be used as a delimiter between each item in a line. Lines end with the return and line-feed characters. Example entries in a Hosts file are as follows:

```
acct.xco.com    A       128.8.1.1          ; address of host "acct"
xco.com         NS      server.xco.com     ; name server for domain xco.com
fred.xco.com    CNAME   bonzini.xco.com    ; canonical name for alias fred.xco.com
```

Editing the Hosts file

MacTCP software includes a sample Hosts file and the TeachText editor. To create Hosts files for network users, modify the sample file using TeachText, adding text that defines name-to-address mappings for your particular network configuration.

To edit the Hosts file, perform the following steps:

1. Select the sample Hosts file icon titled Hosts, included with your MacTCP software, and open it by choosing Open from the File menu or by double-clicking the icon.

2. Add names and internet addresses in the syntax specified in the previous section.

   You can edit the Hosts file with any word processor as long as you save it as text only, without formatting commands.

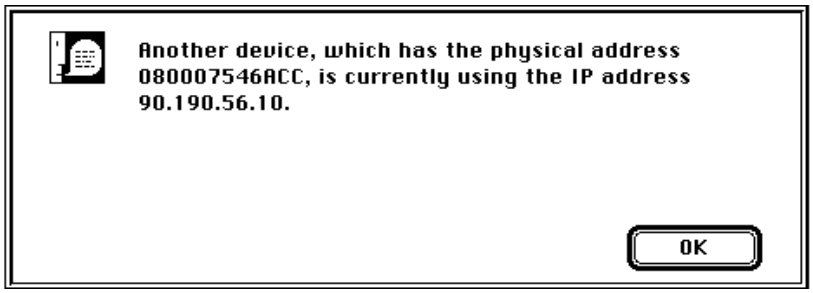
△ **Important** TCP/IP protocols do not allow the use of international and graphics characters. Some word processors and editors do allow these characters; however, using them can cause unpredictable results. △

Appendix B: Troubleshooting

Because an internet is a large and complex aggregate of network hardware connected by gateways, tracking a single-point hardware or software failure can often be difficult. This appendix describes two troubleshooting features— a duplicate address notification dialog box and a fault-isolation tool, MacTCP Ping, which collects and computes packet - transmission statistics.

Duplicate address notification

The TCP/IP Connection software includes a duplicate address notification feature. If there is a duplication problem, the software displays a dialog box informing you that your system is attempting to use the address of another system or that the other system is using your address. The dialog box shows the hardware address of the system that is advertising its use of the particular IP address. This address should be recorded for diagnostic purposes so that a network administrator can correct the problem.



◆ **Note** This dialog box may also appear if MacTCP is configured such that the user's computer is not on the same network as the router. ◆

MacTCP Ping

MacTCP Ping is a network testing tool that uses the Internet Control Message Protocol (ICMP) echo request datagram to elicit an ICMP echo reply from a host or gateway. It is intended for use in network testing, measurement, and management, and should be used primarily for manual fault isolation.

When used for fault isolation, MacTCP Ping should first be run on the local host to verify that the local network interface is up and running. After the local network is verified, hosts and gateways successively farther away should be pinged. MacTCP Ping computes round-trip times and packet-loss statistics. MacTCP Ping can also send IP options along with ICMP echo request packets. This release of MacTCP Ping supports the Record Route option.

When you open MacTCP Ping, the MacTCP Ping information dialog box is displayed. The following sections describe the MacTCP Ping user interface: its menus and the MacTCP Ping Information dialog box.

MacTCP Ping menus

MacTCP Ping provides three menus—File, Edit, and Options—that are discussed in the following sections.

File

The File menu contains the commands Save As and Quit. Save As allows the user to save the session information into a TeachText file. Quit causes MacTCP Ping to stop sending ICMP echo request datagrams to the host (if necessary) and quits MacTCP Ping.

Edit

The Edit menu contains the command Delete Data, which clears the session information from the display window.

Options

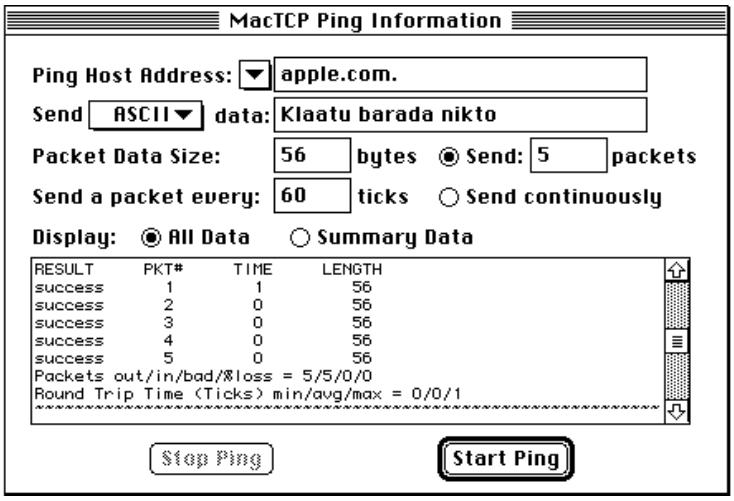
The Options menu contains two commands, Record Route and Show IP Address.

The Record Route command causes MacTCP to send the Record Route IP option along with the ICMP echo packet. The Record Route option provides a means to record the route of an internet datagram. When an internet module routes a datagram, it checks to see if the Record Route option is present. If it is, the module inserts its own internet address into the Record Route buffer of the datagram. When a destination host receives this echo request, it copies its Record Route buffer into the echo response and sends it back to the source host. When the source host receives an echo response, the Record Route buffer contains the round-trip path of the datagram. MacTCP Ping shows the round-trip path of only the last datagram transmitted.

The Show IP Address command displays the IP address of the local host Macintosh computer in the information window.

MacTCP Ping Information dialog box

The following paragraphs describe features of the MacTCP Ping Information dialog box.



Ping Host Address

The pop-up menu displays a list of host name addresses from the MacTCP Hosts file. The user can choose from this list or manually type the host name or IP address of the destination host to be pinged.

Send ASCII/Hex Data

The user can send either ASCII or hexadecimal data along with an ICMP echo request datagram. The ASCII/Hex pop-up menu lets the user choose between these two commands. Hexadecimal data should be entered as a hex string (0-9, A-F and a-f). The Hex Data command is useful for diagnosing data-dependent problems in a network.

Packet Data Size

Packet Data Size specifies the number of data bytes to be sent. The default is 56, which becomes 64 ICMP data bytes when combined with the 8 bytes of ICMP header data. MacTCP Ping allows the user to send up to 5000 bytes in one ICMP echo request packet.

Send a Packet Every # Ticks

MacTCP Ping waits a given number of ticks between sending each packet. (One tick is 1/60 second or approximately 17 milliseconds.) The default is 60 ticks (that is, 1 second). The minimum value allowed is 1 tick (17 milliseconds). This value should be used carefully, since it can flood the network with ICMP datagrams. “Flood pinging” is not recommended in general, and flood pinging the broadcast address should only be done under very controlled conditions.

MacTCP Ping can send either a fixed number of echo requests or it can send requests continuously until the user clicks the Stop Ping button.

Display

The user can choose from two features to display the ICMP session information. The All Data option shows the status information of every ICMP echo request packet. The Summary Data option shows only the summary information about the ICMP session.

Start Ping

When the Start Ping button is clicked, MacTCP Ping starts sending ICMP echo request datagrams to the host.

Stop Ping

When the Stop Ping button is clicked, MacTCP Ping stops sending ICMP echo request datagrams to the host.

Information/statistics area

ICMP packet statistics, along with the source and destination host addresses, are displayed in the bottom rectangular area. The Display-All Data option displays the packet number, round-trip time, and data length. The Display-Summary Data option displays only the average round-trip time and percentage packet-loss statistics. If the Record Route command has been selected, the route of the last packet is displayed in this area.

The Apple Publishing System

The *TCP/IP Connection User's Guide* was written, edited, and composed on a desktop publishing system using Apple Macintosh computers, an AppleTalk network system, Microsoft Word, and QuarkXPress. Line art was created with Adobe Illustrator. Proof pages were printed on Apple LaserWriter printers. Final pages were output directly to 70-mm film on an Electrocomp 2000 Electron Beam Recorder. PostScript™, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.

Text and display type are Apple's corporate font, a condensed version of Garamond. Bullets are ITC Zapf Dingbats®. Some elements, such as program listings, are set in Apple Courier, a fixed-width font.